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HERITAGE RIVERS BIBLIOGRAPHY

~ Selected References ~



Parks Canada Parcs Canada

Planning Division
ARC Branch
PARKS CANADA
December 1979
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- HERITAGE RIVERS BIBLIOGRAPHY -

SELECTED REFERENCES FROM
ARC BRANCH, PARKS CANADA
CARD INDEX

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FOREWORD

Since 1971, Parks Canada has taken a particular interest in the protection of Canada's river heritage. From 1971 to 1973, Parks Canada surveyed more than 65 of Canada's major wild rivers. Since then, Parks Canada has produced a series of public information booklets based on the Wild River Survey reports. During the past year, Parks Canada has taken a lead role in consultations with provincial and territorial agencies towards the establishment of a Canadian Heritage Rivers System. This initiative is continuing to take shape at the time of writing this report.

During the summer of 1979, the ARC Branch, Parks Canada, through the summer student employment program, carried out bibliographic research over a six week period to identify and record references related to heritage rivers for future internal use. Because of the time constraint, research was largely confined to Canadian, United States and British sources which were readily available either in Ottawa or through inter-library loan. A card file, containing several hundred references, many with annotations copied directly from a variety of bibliographic sources,* was prepared. Where references are held by Parks Canada or the Department of Indian and Northern Affairs Library, the location of these studies within these agencies was also noted.

ARC Branch has received a number of requests during the past few months for information on heritage rivers, including requests for reference materials, research documents and background reports. In response to these requests, the ARC Branch reference cards on heritage rivers have been organized into a number of categories and references from each category have been copied to allow for distribution of the information. Photocopies of those selected cards which follow should be viewed as a working tool designed to provide interested agencies and individuals with the opportunity to make use of the information collected by ARC Branch during the past summer. It should be emphasized that this information is simply a reproduction of existing bibliographic reference materials and their accompanying annotations and does not represent any new research or analysis by the ARC Branch.

It is hoped that the information contained in this document will assist in the establishment of river systems in Canada which will ensure their conservation, interpretation and proper management.

Bibliographical sources whose annotations are utilized in this document are credited by means of an asterisk() in Section I-6, Bibliographies Related to Heritage Rivers, pp. 241-45 and elsewhere as required.

1. CLASSIFICATION AND SELECTION TECHNIQUES FOR HERITAGE RIVERS

A. CLASSIFICATION SYSTEMS

Arkansas Planning Commission. 1969. Stream preservation in Arkansas. Report of the State Committee on Stream Preservation, Arkansas Planning Commission, Midwest Research Inst., Kansas, Missouri. 123 p. + illus.

Abstract: Includes a descriptive analysis of the five main rivers and streams in Arkansas as the basis for a program to preserve streams in Arkansas for their "economic, aesthetic, historic, recreational and intangible values".

Keywords: Waterway Preservation, Arkansas, Waterway Classification.

Arighi, Scott, and Margaret S. Arighi. 1974. Wildwater touring. 334 p. MacMillan Co., Inc., New York, New York.

Contains a section on a method for classifying rivers as to the difficulty the river user experiences while attempting to navigate the river. Difficulty ratings are also defined by the type of water craft used to float a river.

Aukerman, Robert, and George Chesley. 1971. Classifying water bodies: feasibility and recommendations for classifying water. 123 p. Final Report, Dep. Recreation Resour. Colorado State Univ., Ft. Collins, Colorado.

Determines the feasibility of classifying water bodies and segments of water bodies by potential use. Identifies criteria for a water classification system and evaluates existing natural resource classification systems. Finds that satisfactory classification by potential optimum use requires a comprehensive planning process that identifies conflicts and is basically a decision-making system.

Proposed Stream Classification System; Wolf, Bauer; 1971.

Belisle et al. Texas Waterways: A feasibility report on a system of wild, scenic, and recreational waterways in Texas. Preservation, history, summary of other state action, intergovernmental cooperation. November, 1973. Texas Parks and Wildlife Department, John H. Reagan Building, Austin, Texas 78701. ARC library.

Carlson, J. E., D. L. Grant, E. L. Michalson, J. H. Mulligan, and J. K. Van Leuven. 1976. Developing criteria to classify wild and scenic rivers. Res. Tech. Completion Rep. 117 p. Idaho Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Presents a multidisciplinary effort to develop river classification alternatives. Physical, economic, and community density factors were each given a numerical value on six natural river stretches along the Priest River and Priest Lake in Idaho. The values were then used to compare the suitability of each of the stretches with the 3 classification criteria (wild, scenic, recreational) specified under the National Wild and Scenic Rivers Act.

"Classifying Water Bodies - Feasibility and Recommendations for
Classifying Water," Colorado State University, July 1971.
NTIS, PB-208 667. 35.

Craighead, Frank C., Jr., and John J. Craighead. 1965. River systems-recreational classification, inventory and evaluation. Naturalist 16(3):33-43. (Reprinted from Naturalist 13(2), 1962.)

Proposes a method to inventory and evaluate river recreation resources based on size, condition, and recreation use of the rivers. Delineates four classes of rivers: wild, semiwild, semiharnessed/developed, and harnessed/developed.

Craighead, John J. 1965. Wild River. Naturalist 16(3):1-5.

Describes the experience of running a wild river and the fragility of the river resource. Suggests a classification system for types of recreation use of rivers. Urges national legislation to preserve wild rivers for the future.

Florida Department of Natural Resources. A system of scenic and wild rivers as a part of the Florida recreation and parks programs published by the Division of Recreation and Parks, Florida Department of Natural Resources, Larson Building, Tallahassee, Florida. Copy location: ARC library.

Hooper, R.A. 1975. "An Evaluation of Systems for Ranking and Rating the Recreational Resource Base of Natural Waterways." M.A. thesis, University of Calgary.

Knudson, Douglas M. 1976. A system for evaluating scenic rivers. Water Resour. Bull. 12(2):281-289.

Describes a system for evaluating rivers for classification in State programs. The system described was developed for Indiana rivers. Rivers must first meet minimum standards for naturalness and suitable adjoining land areas. Then they are rated on bank vegetation, stream course alterations, man-made structures and roads near and across the river, aesthetic quality of the water, and special natural features. Sample rating for the Tippecanoe River is included.

Leopold, Luna B., and M. G. Wolman. 1957.
River channel patterns: braided,
meandering and straight. U.S. Geol.
Surv. Prof. Pap. 282-B, Washington, D.C.

Manitoba Department of Tourism, Recreation and Cultural Affairs, Parks Branch, 1972. Wild River Study: East Side of Lake Winnipeg.

Provides a description and analysis of four rivers on the east side of Lake Winnipeg to determine their suitability for "Wild River" status. Recommendations pertaining to park land classifications were developed and based upon information collected through aerial reconnaissance and application of a modified version of the Leopold Inventory Technique.

Outdoor Recreation Council of British Columbia.

British Columbia's Trails, Rivers and Shorelines:
A Status Report. A report submitted to the
Minister of Recreation and Conservation. February,
1977. Available from the Outdoor Recreation
Council of British Columbia, 1606 West Broadway,
Vancouver, B.C. V6J 1X7.

This draft report calls for the classification
of trails, rivers and shorelines, reviews,
legislation and mechanisms for conserving linear
recreation corridors, and calls for the development
of a Trail, River and Shoreline Conservation
Program for British Columbia.

Rudd, Clayton G. ed. "River Recreation Featuring
Michigan, Minnesota and Wisconsin". Naturalist
Vol. 26. Spring, 1975.

Several articles are presented in this issue
devoted to river recreation, the concentration
being on evaluation and classification of wild
and scenic river systems.

Taylor, Gordon D., and Clarke W. Thompson. 1966. Proposed methodology for an inventory and classification of land for recreational use. For. Chron. 42(2):153-159.

Presents a method to inventory and rank landscapes for recreational use. Utilizes four criteria to evaluate them: water, cover, slope, and relief. Delineates a four-fold process to both itemize and scale landscape types. The recreational potential of sites is based on the presence or absence of limiting factors that affect their development for recreational uses.

A.H. Underhill

Wild and Scenic Rivers Study

wild rivers, classification

U.S. dept. of Interior, Bureau of Outdoor Recreation
Washington, 1969.

US Bureau of Outdoor Recreation

Wild and Scenic Rivers

criteria, legislation, types, administration, use, preservation
June 1975,

Bureau of Outdoor Recreation, U.S. dept. of Interior,
Washington, D.C. 20240

U.S. Dept. of Interior.

Guidlines for evaluating wild, scenic and recreational river

areas proposed for inclusion in the national, wild, and scenic rivers system
under Section 2, Public Law 90-542,

Wild and scenic rivers act, Criteria

Feb., 1970.

U.S. Dept. of Interior

U. S. Bureau of Outdoor Recreation and U. S. Forest Service. 1970 "Guidelines for Evaluating Wild, Scenic and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic River System under Section 2, Public Law 90-542." Washington, D. C. (mimeo.), 12 p.

Paper recommends that in evaluating a river for possible inclusion in the System or for determining its classification, the river and its immediate land area should be considered as a unit, with primary emphasis upon the quality of the experience and the overall impressions of the recreationist using the river or the adjacent riverbank. These guidelines define the criteria for classification, designation and administration of each of wild, scenic and recreational river. The criteria are outlined in terms of degree of development (man-made structures), accessibility, length of river or river segment, recreational potential, aesthetics, and water quality. All rivers included in the national system should meet the "Aesthetics - General Criteria" as defined by the National Technical Advisory Committee on Water Quality in the Federal Pollution Control Administration's Water Quality Criteria, 1968. The management objectives of each class of river are outlined. (Abstract from Dooling, 1975).

INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION.
1972. WILD, SCENIC, AND RECREATIONAL RIVERS. 118 P. RIVERS
SUB-COMMITTEE, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION,
OLYMPIA, WASHINGTON.

PRESENTS THE RESULTS OF AN EFFORT TO PRODUCE A SYSTEM OF CLASSIFYING RIVERS AND AN INVENTORY PROCEDURE TO GATHER DATA. DEVELOPED A 2 PART CONCEPT OF RIVER ENVIRONMENTS FOR THE CLASSIFICATION SCHEME. THE FIRST PART IS THE GEO-HYDRAULIC ZONE SYSTEM FOR SUBDIVIDING THE RIVER INTO ZONES ON THE BASIS OF CERTAIN NATURAL CHARACTERISTICS USING THE "STREAMWAY" AS AN ENVIRONMENTAL UNIT. THE SECOND PART CLASSIFIES THE RIVER BY UNIT AS WILD, SCENIC OR RECREATIONAL BASED ON MAN'S INVOLVEMENT IN THE RIVER ENVIRONMENT. REPORTS 2 PILOT STUDIES TO TEST THE INVENTORY PROCESS ON THE YAKIMA AND SKOHOMISH-SKYKOMISH RIVERS IN WASHINGTON STATE.

Welch, D. Land/Water Classifications: A review of water classification and proposal for water integration into ecological land classification 1978 54p

Documentation Center 25th floor QH 0541.B5

B. INVENTORY OF RIVER RESOURCES

Pabcock, R. E. 1976. Buffalo National
River ecosystems, part II. Water
Resour. Res. Cent., Publ. 38, 279 p.
Univ. Arkansas. Fayetteville.

Baron, Adelbert Martin. "The Resources of Hood River Country, Oregon:
Inventory and Prospect." Oregon State College, 1957.

Barry, Rojer J. "The Resource Base for Water-Oriented Recreational Areas
in Coles and Cumberland Counties, Illinois." Eastern Illinois
University, 1965.

Borden, Yates F., Brian J. Turner, and Charles M. Strauss. 1977. Colorado River
campsite inventory. In: River recreation management and research Symp. Proc. USDA
For. Serv. Gen. Tech. Rep. NC-28, p. 226-231. North Cent. For. Exp. Stn., St. Paul,
Minnesota.

Shoreline beaches along the Colorado River in the Grand Canyon are regularly used by river-
running parties as overnight campsites. The availability of campsites in river sections
where they are scarce, small, or both, limits the number and size of parties that can be
permitted without risking unacceptable environmental degradation. Therefore, a comprehen-
sive inventory of usable campsites was made and it revealed that 345 campsites are avail-
able for overnight camping by river-running parties.

Brown, William E. 1971. Islands of hope.
194 p. Natl. Rec. & Parks Assn.,
Washington, D.C.

Black River - St. Lawrence Regional Planning Board
Canton, N.Y.

Cultural Resources of the Black River - St. Lawrence Region.
Dec., 1973.

National Technical Information Service,

Springfield, Va 22151

191 pp

\$9.95

Bristol Avon River Authority. Survey of Water Resources and Demands. 1973.

CANADA DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

1972a. Summary report on the wild rivers survey, Yukon Territory, 1971. DIAND Natl. Hist. Parks Br., Planning Div., Ottawa. unpubl. special report, 23p., illus.

"As part of its obligation, the National and Historic Parks Branch has the responsibility for preserving outstanding and representative samples of Canada's wild river heritage within the National Parks system. Because Canada is particularly well endowed with rivers, particularly in the North, a systematic rationale is necessary to select the most outstanding and unique rivers for protection from unrestricted use and development." During the summer of 1971, a pilot study of 15 major rivers was carried out to apply Luna Leopold's technique for quantitatively evaluating wild rivers. This report introduces the Leopold technique and the subjective analysis parts of the study, then summarizes the subjective analysis of each study river, describing the geography, points of interest, difficulties in travel, etc. of the rivers. The quantitative results of applying the technique are not included.

Canada Dept. of Indian Affairs and Northern Development. 1973.

Wild Rivers survey, 1972 - summary report. DIAND Natl. Hist. Parks Br., Planning Div., Ottawa. unpubl. special report #73-3, 65 p., illus.

Abstract: In the summer of 1972, 3,300 miles of Canadian "wild" rivers were surveyed from the Yukon Territory to Newfoundland and Labrador. The rivers were chosen on the basis of: (1) National Park Natural Region representation (National Park System Planning Manual) in terms of Canada's 39 natural regions; (2) historic routes; and (3) simplicity of studying those rivers which could be feasibly examined from the study centre in one field season. Reports on each river include a written descriptive section and a quantitative inventory/analysis section. This second summer continued to apply a modified version of Leopold's technique for evaluating wild river sites. This summary report includes an outline of the major geographic, historical, recreational, etc. features of the rivers studied during the summer of 1972.

Keywords: Wild Rivers, Waterway Preservation, Canada, Waterway Evaluation.

Canada Department of Indian and Northern Affairs. Parks Canada

Wild Rivers: Alberta, Ottawa, 1974

Wild Rivers: Central British Columbia, Ottawa, 1979

Wild Rivers: Newfoundland and Labrador, Ottawa, 1977

Wild Rivers: Quebec North Shore, Ottawa, 1976

Wild Rivers: Saskatchewan, Ottawa, 1974

Wild Rivers: The Barrenlands, Ottawa, 1979

Wild Rivers: The James Bay/Hudson Bay Region, Ottawa, 1977.

Canada Wildlife Service,
Special Habitat Evaluation Group
An inventory of wildlife habitat of the MacKenzie Valley and
the Northern Yukon, 1971.
152 p.
Ministerial library 14th floor
QH 541 - 5P6.C-35 no 73-27

Carbyn (LN).
Natural features of the Willow Creek area:
Jasper National Park. 1972. 23p.
Documentation Center 25th floor
QH0005 17n

R.E. Carlson
Natural, Archaeological, and Historical Resources of the Wabash River
Basin, Indiana, Illinois.
identification, evaluation, preservation, methods 1969 c.

Indiana University
Bloomington, Indiana 47401
or
U.S. Depart. of Interior, National Park Service

Collins, H.
Newfoundland and Labrador Canoe Route
Inventory. 40 p. Volx Eagle River Labrador.
Documentation Center 25th floor
6B 1205 LSS

Carothers, Steven W., and Stewart W.
Aitchison, eds. [In press.] An Ecological Survey of the Riparian Zone of the Colorado River between Lee's Ferry and the Grand Wash Cliffs, Arizona. Natl. Park Serv., Grand Canyon Natl. Park, Arizona.

Carpenter, K. E. Life in Inland Waters. Macmillan, 1928.

"The Colorado River...from its sources to the Sea", in Arizona Highway 44(5)
historical significance, legislation, state agencies, federal agencies, Colorado river compact, Indian lands
May, 1968
3 pp

Dirschl, HJ.
Land Capability for Wildlife production and Utilization in the Western Saskatchewan River Delta.
Ottawa, 1967. 233 p.
Ministerial lib 14th floor 5964.53 D57

Dunn, M. Scenic Routes and Recreation Planning - the Teme Valley Experiment 1973. University of Birmingham
Center for Urban and Regional Research, Research Memorandum 27, 1973

Friesen, Richard
Theme and Resource Assessment
Yukon Recreational and Historic Waterway. Parks Canada
prepared for ARC Branch. Oct, 1978. 210p.
document No. 10775
ARC library copy location

Heldt, George
Platte River Basin-Nebraska: Level B Study
U.S. Bureau of Outdoor Recreation 1975
Study Office
Missouri River Basin Commission
521 South 14th St.,
Suite 204
Lincoln, Nebraska 68508

Hooper, R.A.
The Navigable Mountain Rivers Study:
Summary and Conclusions. Natural Research Division,
Parks Canada, Western Region 1978 116 p.

Hornby, John
Wildlife in the Thelon River, NWT,
Canada. Reprinted from the Canadian Field Naturalist Vol. 47
No. 7 Oct. 1934
p. 105-112
Min. Lib. 14th floor 2467

Juurand, Priidu. 1972. Summary report on the wild rivers survey, Yukon Territory, 1971. 25 p. Can. Dep. Indian Aff. North Dev., Natl. Hist. Parks Branch, Plann. Dev., Ottawa, Canada.

Summarizes a wild rivers survey conducted in the Yukon Territory during the summer of 1971. Information was collected to test methods (such as Leopold's uniqueness ratio) for ranking rivers for inclusion in a system of wild rivers. Subjective analysis of each study river was conducted and the results are summarized. Recommends inclusion of the Yukon and Ogilvie-Peel Rivers in a Canadian wild and scenic rivers system.

Juurand, P. 1972. "Summary Report on the Wild Rivers Survey, Yukon Territory, 1971." Canada Department of Indian Affairs and Northern Development. National and Historic Parks Branch, Planning Division Ottawa, unpub. special report. 23 p.

A pilot study of 15 Yukon rivers was carried out during the summer of 1971 to apply the inventory technique developed by Luna Leopold. The Leopold technique and the descriptive analysis is provided. General geography, points of interest, navigational hazards, etc. are discussed.

Juurand, P. 1973. "Wild Rivers Survey, 1972. Summary Report." Canada Department of Indian Affairs and Northern Development. National and Historic Parks Branch, Planning Division, Ottawa. special report #73-3.

65 p.

In the summer of 1972, 3,300 miles of Canadian "wild" rivers were surveyed from the Yukon Territory to Newfoundland and Labrador. The rivers were chosen on the basis of: 1), National Park Natural Region representation (National Park System Planning Manual) in terms of Canada's 39 natural regions; 2), historic routes; and 3), simplicity of studying those rivers which could be feasibly examined from the study centre in one field season. Reports on each river include a written descriptive section and a quantitative inventory and analysis section. The summary report includes an outline of the major geographical, historical and recreational features of the rivers studied during the summer of 1972.

Juurand, P. 1974. Description and analysis of scenic resources along the Churchill, Sturgeon, Weir, and Clearwater Rivers. 19 p. Planning Div., Natl. and Historic Parks Branch, Ottawa.

Kellerhalls, R., C. R. Neill, and D. I. Bray. 1972. Hydraulic and Geomorphic Characteristics of Rivers in Alberta. River Engineering and Surface Hydrology Report 72-1.

Kuska, J. J., J. S. Edstrom, and M. H. Smithberg. 1974. St. Croix-Namekagon River resource inventory. Misc. Rep. 122. 23 p., illus. Agric. Exp. Stn., Univ. Minnesota.

Kuska, James J., J. S. Edstrom, and M. H. Smithberg. 1974. St. Croix-Namekagon River Resource Inventory. Agric. Exp. Stn. Misc. Rep. 122-1974, 23 p. Univ. Minnesota, St. Paul, Minnesota.

Describes a method used to categorize resource features for evaluation of recreation site potential along the St. Croix and Namekagon Rivers in Wisconsin and Minnesota. Three environmental factors were studied: (1) regional characteristics (geology, topography, soils, vegetation), (2) river criteria (length, gradient, width, rapids, sinuosity, island) and (3) cultural features (roads, railroads, towns, residences). The optimum location for developing user facilities can be determined by using this method.

Kovacs, Tom.

Musquodoboit Valley Recreation Land Use Analysis 1969
Dept. of Energy, Mines & Resources Policy & Planning
Division Nova Scotia

Also contains Recreation Potential of the Musquodoboit Watershed
by Kess Verburg, Cottage Potential of the Musquodoboit
Watershed by Kess Verburg and P.A. Gillis.

Documentation Center 25th floor
HC 0070 R3K 84m

MacPerson.

Historical Development of the Lower Red Deer Valley Alberta
240 p

Documentation center 25th floor
QE 0045 M24H

Maine State Parks and Recreation Committee. n.d. Allagash Wilderness Waterway.
Augusta, Maine.

Mann, Roy.
Rivers in the City, 1973.
David and Charles
Brunel House,
Newton Abbot
Devon, England

Maryland Department of State Planning. 1970. Scenic rivers in Maryland. Maryland Dep. of State Planning and the Scenic Rivers Review Board, Baltimore, Maryland, 40 p., illus.

Abstract: Following enactment of Maryland's Scenic Rivers Act, a Scenic Rivers Review Board was given the responsibility to annually inventory potential scenic river sites. This report is the first of the annual findings and recommendations; it includes the description and evaluation of five recommended Scenic Rivers. Outlines the methods of compiling information and the criteria used (based on categories of physical, biological and water quality, and human use and interest).

Keywords: Waterway Evaluation, Scenic Rivers, Maryland.

Murphy, H.R. and TR.Porter.
Stream Survey of 31 Rivers in Labrador
St. John's Newfoundland.1975.
Internal Report Series. 1-74-8 Vol. 1
English River to Fraser River
Documentation Center 25th floor
SHO 349 M95p

Natural Historical Parks Branch, Planning Division. 1973. Summary report wild rivers survey 1972. Spec. Rep. 73-3, 65 p. Can. Dep. Indian Aff. North Dev., Ottawa, Canada.

Summarizes a 1972 inventory of wild rivers in Canada. Study rivers were chosen for their potential national park-natural region representation, association with historic routes, or logistics. Results are presented by region: western mountain area, barrenlands area in the northwest, Canadian shield (central), Canadian shield (eastern), and Appalachians area in Newfoundland. Evaluation of river sections is based on river location, water and channel characteristics, valley characteristics, historical/cultural features, scenic quality, and recreation quality.

New Hampshire State Planning Project. Land Water Recreation. New Hampshire Public Water Bodies and Public Access Points. Part 1. Report Number 4. Concord, New Hampshire: State Planning Project, August, 1964.

Newfoundland and Labrador Development Corporation Limited and Regional Economic Expansion
Happy Valley - Goose Bay Regional Profile including
Northwest River and Mud Lake.
Labrador, Canada. January.1976.
Documentation Center 25th floor 0623 K81

THE CATSKILL CENTER FOR CONSERVATION AND DEVELOPMENT, INC.
1975. WILD, SCENIC AND RECREATIONAL RIVERS IN THE CATSKILL
PARK.
184 P. DEP. ENVIRONMENTAL CONSERV., NEW YORK.

DESCRIBES THE CATSKILL PARK WATERSHED AND SUMMARIZES
RECOMMENDED CLASSIFICATIONS OF THE 7 MAJOR STREAMS UNDER THE
1972 NEW YORK STATE WILD, SCENIC AND RECREATIONAL RIVERS
ACT. REPORTS THE RESULTS OF INVENTORY STUDIES OF 4 STREAMS,
THE BEAVERKILL, WILLOWHOC, NELVERSINK AND ROUNDOUT.

Ontario Dept. of Energy and Resource Management, Conservation
Authorities, Rideau Valley Conservation Report, history
landuse and forest, water, biology, recreation
Toronto, 1968. 230 p.
Ministerial lib, 14th floor QL 61 059

Ontario Department of Lands and Forests, Conservation Authority Branch,
Crowe Valley Conservation Report: Water Wildlife, 1963
Toronto
Ministerial lib 14th floor QL 61 059 c

Ontario Dept. of Lands and forests,
Conservation Authority Branch
Sauble Valley conservation reports: Water Wildlife
1962 Toronto
Ministerial lib 14th floor QL 61 C606SW

Oldman River Regional Planning Commission and the Alberta Department
of Environment, n.d. Inventory of River Shorelands: Proposed Data Re-
quirements for Southern Alberta Recreation Enhancement Study. 11 p.

"Sares" has completed an inventory of lakes and is now developing a data
collection system for rivers and river shorelands. Information is designed
to help identify: (1) conflicting land and water uses; (2) how recrea-
tional potential of water resources can be improved through land and water
management programmes; and (3) water bodies suitable for inclusion in a
recreational enhancement programme.

Two types of information are collected. First, information pertaining to
channel morphology, existing land and water uses is summarized for five
mile reaches in addition to identification of aesthetic, cultural, biological
and physical features. Second, information relating to recreation, soil,
ungulate, waterfowl, forestry and sport fish capability is gathered. No
method by which a measure of capability is determined is presented, although
use of C.L.I. data is implied.

Olsen, Charles E., Jr., Larry W. Tombaugh,
and Hugh C Davis. 1969. Inventory of
recreation sites. Photogram. Eng.
35(6):561-568.

Ontario Department of Lands and Forests.
1968. Methodology for Ontario recreation
land inventory. 27 p. Maple, Ontario.

Pfister, Robert E., and R. E. Frenkel.
1974. Rogue River study. Interim Rep.,
112 p. Oregon St. Marine Board and
Water Resources Inst., Corvallis, Oregon.

Porter, T. Riche, L. Traverse, A.
Catalogue of Rivers in insular Newfoundland, Canada Dept. of the
Environment — Fisheries and Marine Service. 1974. 353 p.
Documentation Center 25th floor GB 1205 C16

Pringle, Laurence P. Wild River, Philadelphia Lippincott 1972 128p
An examination of North American Stream Ecology, Ministerial hb
14th. QHS41 .S57 p75

Reid, George K. Ecology of Inland Waters and Estaries. Rein-
hold, 1961.

SOUTH CAROLINA DEPARTMENT OF PARKS, RECREATION AND TOURISM
AND WILDLIFE AND MARINE RESOURCES DEPARTMENT.
1978. SOUTH CAROLINA RIVER TRAILS STUDY.
93 P. COLUMBIA, SOUTH CAROLINA.

DESCRIBES AND PRESENTS THE RESULTS OF A STUDY TO DESIGNATE A
SYSTEM OF RIVER TRAILS IN SOUTH CAROLINA. INCLUDED IN THE
STUDY WERE A DEMAND/NEED QUESTIONNAIRE SURVEY TO MEASURE
RIVER USE, A RESOURCE INVENTORY AND EVALUATION TO SELECT
RIVERS FOR STUDY, AND A SELECTION PROCESS TO DETERMINE WHICH
RIVERS SHOULD BE INCLUDED IN THE TRAILS SYSTEM. ALSO
INCLUDES A SECTION ON RECREATIONAL DEVELOPMENT
CONSIDERATIONS TO REDUCE USER IMPACTS AND AN APPENDIX WITH
SAMPLES OF FORMS USED IN THE STUDY.

S. Snook
"River-to-River Road, George Rogers Clark Recreation Way in
Parks and Recreation, April, 1968
scenic roadways, rivers, Illinois, Ohio River, Mississippi River
Recreation Resources

Suttkus, Royal D., Glenn H. Clemmer,
Clyde Jones, and C. Robert Shoop. 1976.
Survey of the Fishes, Mammals, and
Herpetofauna of the Colorado River and
Adjacent Riparian Areas of the Grand
Canyon National Park. Unpubl. Natl.
Park Serv. final report.

Udall, S.L. "New Adventures: Wilderness Rivers,
Shooting the Wild Colorado" in Venture 5 (1).
February, 1968. 10 pp. Wild rivers, rafting,
dams, Grand Canyon National Park.

U.S. Department of Agriculture, Forest
Service. 1972. Forest Service handbook,
recreation inventory instructions.
147 p. U.S. Gov. Print. Off.,
Washington, D.C.

Buffalo National River. Field Investigation Report. U.S.D.I.
Washington, D.C.: National Park Service, U.S. Department
of Interior, 1963.

A Survey of Rivers in the St. Lawrence Valley
Physiographic Province to identify Potential National Wild
and Scenic Rivers. feb. 1976 15p
copy loc. ARC Branch

State Dept. of Environmental Resources
Pennsylvania Scenic Rivers Inventory:
Scenic rivers, criteria, planning priorities 1976
Pennsylvania
Dept. of Environmental Resources
PO Box 1467
Harrisburg, PA
17120

Wang, D., A. Parks, L.F. Pettipas, Manitoba Dept. of Tourism
Recreation and Cultural Affairs, The Assiniboine Route of Manitoba
Oct, 1975. 146p
Corridor Study, historical resources, natural resources, heritage
ARC library

Ward, J.C. Rivière a Salmon dans le Parc National Perillon
1974. 15p.
Documentation Center 25th floor CB 1205 E21

C. EVALUATION OF HERITAGE SIGNIFICANCE
AND RECREATION POTENTIAL

Anderson, D. L. "The Recreational Capability and Use of Wabamun Lake and the Eastern Half of Lesser Slave Lake." University of Alberta, Edmonton, 1967.

Anderson, F. J. and N. C. Bonsor. 1974. "Allocation, Congestion and the Valuation of Recreational Resources." Land Economics, 50: 51-57.

Ashton, Peter G., and Michael Chubb. 1972. A preliminary study for evaluating the capacity of waters for recreational boating. Water Resour. Bull. 8(3):571-577.

To determine the mathematical relation between use levels and user satisfaction, the quality of recreation experiences were examined for two groups of lake users in southeastern Michigan. Carrying capacity limits for boating were established, based on mailed questionnaires, personal interviews, and aerial photographs. Satisfaction was as important a variable in setting use limits as was the actual space available.

Baker, W. M. 1961. Assessing and allocating renewable resources for recreation. Resources For Tomorrow, Conf. Background Pap. 11(8):981-1001. Queen's Printer, Ottawa.

Eauman, Eric Hans. 1976. A method for assessing river recreation potential. M.A. thesis. Dep. Geogr., Michigan State Univ., East Lansing, Michigan. 188 p.

Develops an objective method to evaluate the recreational potential of riparian corridors and to inventory existing river characteristics. Sixty-seven variables in eight categories were evaluated along river segments of the Pine, Manistee, and Looking Glass Rivers in Michigan. Each variable was ranked for 16 recreation activities. A literature review of techniques for assessing recreation values is included.

Fitzley, C. and W. M. Hanemann. 1976. The Recreation Benefits of Water Quality Improvements: Analysis of Day Trips in an Urban Setting. Prepared under EDA contract 68-01-2282, June 1976.

British Waterways Board. British Waterways: Recreation and Amenity (White Paper). Her Majesty's Stationary Office, 1967.

~~British Waterways Board.~~
British Waterways: Recreation and Amenity (White Paper).
Her Majesty's Stationary Office, 1967.

Brown, R. "The Natural Outdoor Recreational Resources of Muskoka: An Approach to the Inventory and Evaluation of Outdoor Recreation Resources." University of Waterloo, 1968.

Burch, William K., Jr. 1974. Observation
as a technique for recreation research.
In land and leisure: concepts and methods
in outdoor recreation. Chapter 9, p.
130-145. Maaroufa Press, Chicago,
Illinois.

Burgess, Linda Louise. "Recreation Potentials of the Islands and Marshes Adjacent to the Intercoastal Waterway." Oregon State University, 1970.

Canada Land Inventory. 1967. Field manual: land capability classification for outdoor recreation. 125 p. ARDA, Canada Dep. For. & Rural Dev., Ottawa.

Canada Department of Environment. Natural History Research Division. A system to inventory and evaluate mountain rivers for Canoeing and Kayaking: A basis for the determination of recreation potential. Research paper 77-3. Western Region, Parks Canada. 1978.

In addition to this inventory and evaluation system, a good bibliography of analysis techniques for river recreation resources and potentials is provided.

Parks Canada. 1978. The Athabasca River: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking.

Parks Canada. 1977. The Bow River: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking.

Parks Canada. 1977. The Kicking Horse River: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking.

Parks Canada. 1978. The North Saskatchewan River: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking.

Parks Canada. 1978. The Vermilion-Kootenay River System: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking.

Canada Parks Canada.
Western Region.

The Kicking Horse River: A description and evaluation of Recreational Potential for Canoeing and Kayaking. 1977. 75 p.
documentation Center 25th floor

Canada Parks Canada
Western Region.

The Athabasca River A Description and Evaluation of Recreational Potential for Canoeing and Kayaking. 1978.
127 p. Navigable Mountain River Study
GB1201.15 C16a Documentation Center 25th floor

Parks Canada. 1977. The Waterton River: A Description and Evaluation of Recreational Potential for Canoeing and Kayaking (with a Brief Description of the Belly River).

- * Copies of these reports can be obtained by writing the Director, Western Region Parks Canada, 134 - 11th Avenue S.E. Calgary, Alberta T2G 0X5
Attention: B.F. Leeson.

Canada, Parks Canada. The English River; An Assessment of its National Significance, by Mondor C.A. coordinator Area Identification Section, Parks System Planning Division, National Parks Branch
July 28, 1976. 30 p.
copy location ARC library

Cesario and Knetsch. 1970. "Time Bias in Recreation Benefit Estimates." Water Resources Research, 6: 700-704.

Chubb, M. and E. H. Bauman. 1976.
"Assessing the Recreational Potential of Rivers," Proc. of the 72nd Annual Meeting of the Association of American Geographers.

Identifies the need for a technique suitable for evaluating and demonstrating the recreational potential of rivers in a comprehensive and comparative manner. Paper describes the initial stages of the development of such a technique for the U. S. Forest Service. The method is based on the quantitative assessment of the nature and distribution of a wide range of physical and cultural characteristics which affect a river's suitability for 16 different recreational activities.

Chubb, Michael, and Eric H. Bauman. 1977b.
The rivers method: a pilot study of river recreation potential assessment.
83 p. Dep. Geography, Michigan State Univ., East Lansing.

Chubb, Michael. 1977. River recreation potential assessment: a progress report. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 83-90. North Cent. For. Exp. Stn., St. Paul, Minnesota.

In the past most river recreation was managed from the viewpoint of rectangular land areas rather than complete river systems. Managing from a river-oriented viewpoint gained momentum with the passage of the Federal Wild and Scenic Rivers Act, but no widely adopted method of assessing river recreation potential has yet been developed. Several approaches to potential assessment are summarized. The RIVERS Method involves assessing 67 variables for each mile of river and evaluating the potential for 16 recreational activities.

Chubb, Michael, and Eric H. Bauman. 1977. Assessing the recreation potential of rivers. J. Soil and Water Conserv. 32(2):97-102.

Although many ways of assessing river recreation potential have been suggested, no universally applicable method has been devised. The RIVERS Method, currently under development for the USDA Forest Service, attempts to evaluate and compare the potential of all types of rivers for recreation activities.

Clawson, Marion, and Jack L. Knetsch. 1966. The economics of outdoor recreation. 328 p. The Johns Hopkins Press, Inc., Baltimore, Maryland.

Crane, D. A. 1970. "A Discussion of Estimating Water Oriented Recreation Use and Benefits." Paper presented at the Ninth Annual Environmental and Water Resources Engineering Conference, Vanderbilt University, June 1970.

Cushwa, C. T., B. S. McGirmes and T. H. Ripley. 1964. "Forest Recreation Estimate and Predictions in the North River Area, George Washington National Forest, Va." Bulletin 558. Blacksburg, Virginia: Agricultural Experiment Station, Virginia Polytechnic Institute, 1964.

Davis, Roger Keith. "The Lower Rogue River Recreation Resources: Development and Potential." Oregon State University, 1966.

Dearinger, John A. 1968. Aesthetic and recreational potential of small naturalistic streams near urban areas. Res. Rep. 13, 260 p. Water Resour. Res. Inst., Univ. Kentucky, Lexington, Kentucky.

A method was developed to evaluate aesthetic and recreational potential of streams and watersheds based on previous work by the U.S. Soil Conservation Service and on the principles of terrain analysis, land use planning, and outdoor recreation economics. Evaluations of stream recreation potential for activities such as camping, fishing, and hiking were made. Concludes that aesthetic and recreational values can be identified, inventoried, and used to evaluate a watershed's development potential; and that accurate estimates of participation demand, acreage requirements for various activities, and benefits gained (by both users and developers) from recreational developments can be projected.

Presents a system designed to evaluate the recreational and aesthetic potential of small natural streams and their watersheds, which are located near urban centres. Evaluations concerning a stream's recreational potential were made for: camping; fishing; picnicking; development of trail systems; aesthetic enjoyment; and the establishment of natural, scenic and historic areas. Additional procedures were developed for estimating: visitation to a developed site; future participation demand and proportion of that demand which could be satisfied at a specific site; and the economic benefits that would accrue if the sites were developed. The evaluation of recreation potential is based upon application of weighted value ratings.

Dearinger, J.A. 1972. "Evaluating the Recreational Potential of Small Streams." Journal of the Urban Planning and Development Division, Proceedings of the American Society of Civil Engineers. 84-103.

Fisher, Dorothy L. 1976. Congress debates a river's future: the Missouri River. Environmental Comment, June 1976, p. 4-5. (A publication of the Urban Land Institute)

Briefly describes efforts to designate a 170-mile stretch of the Missouri River in north-central Montana into the National Wild and Scenic Rivers Act. Also summarizes the findings of a study to determine suitability of the River for inclusion in the system.

deBettencourt, James, and George L. Peterson. 1977. Standards of environmental quality for recreational evaluation of rivers. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 245-255. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Explores the possibility of developing criteria and standards based upon the individual and groups threshold functions by which alternative river recreation sites are accepted or rejected. Explains experimental procedures used to develop the threshold functions. Presents illustrative results of pilot studies. Suggests applications and needs for further research.

1970 Ditton, Robert B.
Water-based recreation: supply and demand considerations,
an interdisciplinary bibliography. 76p. Counc. Planning
Librar., Monticello, Ill.

Ditton, Robert B., Goodale, T.L., Johnsen, P.K. A Cluster Analysis of Activity, Frequency and Environmental Variables to Identify Water Based Recreation Types. Journal of Leisure Research Vol. 7 #4 pp. 282-295, 1975.

Abstracts: Utilizing a sample of 250 individuals from a data base that describes water-based recreation patterns of 2174 heads of household in northeastern Wisconsin, this paper presents the findings of two cluster analyses. The first is based on participation frequencies for eight activities; the second is based on 23 variables combining type of environment with activity frequencies. For both analyses a replication with a second subsample of 250 individuals was carried out indicating stability of the clusters derived. A range of computer programs developed by Wishart (1970) was used for analyzing the data. The first analysis identified eight mutually exclusive clusters of individuals; clusters distinguished from each other by the kind and frequency of their water-based recreation activity. Each cluster was named and characteristics that distinguished the cluster from the total sample were described.

The second analysis based on kind, frequency, and type of environment yielded nine clusters. These clusters were named and cluster characteristics described. Inclusion of the location variable added all important-dimension to cluster analysis and enabled more useful descriptions of participant groups than has previously been done.

After the remaining 1924 individuals were assigned to one of the nine clusters based on their standing on multiple participation variables, each cluster was cross tabulated with 13 predictor variables. With cross tabulations, the exact makeup of the clusters could be established and used for predictive purposes. Some theoretical, methodological, and practical implications of cluster analysis and the clusters derived are discussed.

Donaldson, I. 1975. "A Preliminary Analysis of the Navigational Potential of Rivers in Western Region National Parks." Canada Department of Indian and Northern Affairs, Contract WR141-73.

Dooling, P.J. 1978. "Perspectives on Alternate Approaches To and Evaluation Criteria of Recreation-Resource Inventory and Assessment Systems for Provincial, Regional, and Site Plans." Proc. of the Wildland Recreation Conference.
Banff, Alberta.

DUFFIELD, BENNY.
1972. COMPARISONS OF FLOAT TRIP RECREATION OPPORTUNITIES BY VISITORS TO THE ELEVEN POINT RIVER.
M.S. THESIS. DEP. FOR., UNIV. MISSOURI, COLUMBIA, MISSOURI.

PRESENTS THE RESULTS OF A STUDY OF DIFFERENT TYPES OF FLOAT TRIP VISITORS TO THE ELEVEN POINT RIVER IN SOUTHERN MISSOURI TO DETERMINE HOW THEY COMPARE THE QUALITY OF THEIR RECREATION EXPERIENCE THERE TO OTHER FLOAT RIVER OPPORTUNITIES IN MISSOURI. DISCUSSES IMPLICATIONS OF COMPARISONS OF QUALITY FOR DETERMINING CARRYING CAPACITY. CONCLUDES THAT THE ELEVEN POINT IS CONSIDERED A HIGH QUALITY FLOATING STREAM AND THAT THE QUALITY OF EXPERIENCE IS DECLINING WITH INCREASED PERCEPTION OF TRASH, PEOPLE AND SITE DETERIORATION.

The Estimation of Recreational Benefits Resulting from an Improvement of Water Quality in Upper Klamath Lake: An Application of a Method for Evaluating the Demand for Outdoor Recreation.
Gibbs, Kenneth Charles. Oregon State University, Ph.D., 1969. Page 1708, Volume 30/05-A, DAI.
..... Order No. 69-19,465

Gahan, Lawrence W. "A Regional Analysis of Factors Affecting the Demand for and Participation in Water-Oriented Recreation Activities." Unpublished Ph.D. dissertation, University of Illinois, Urbana, Illinois, 1970.

Gillespie, Glenn Alton. "An Evaluation of the Factors Affecting the Demand for Water-Oriented Outdoor Recreation." Unpublished Ph.D. dissertation, University of Missouri, Columbia, Missouri. 1966

Gillespie, Glenn A., and Durward Brewer. 1969. An econometric model for predicting water-oriented outdoor recreation demand. USDA Econ. Res. Serv. 402, 15 p. Washington, D.C.

Develops and tests an econometric model to estimate future demand at water recreation sites (lakes and streams). To test the model, 1,000 families living in St. Louis, Missouri, were randomly selected and surveyed in 1964. The model correlates socio-economic characteristics of survey group with water-oriented outdoor recreation activities such as swimming, fishing, boating, and water-skiing. Concludes income, age, sex, education, and occupation affect an individual's level of recreation participation and types of recreational activities pursued.

Gunn, Russell L., and William E. Martin. 1975. Problems and solutions in estimating the demand for and value of rural outdoor recreation. Am. J. Agric. Econ. 57(4):558-566.

Gunn, Clare A., David J. Reed, and Robert E. Couch. 1972. Cultural benefits from metropolitan river recreation San Antonio prototype. Texas Water Resour. Inst., Tech. Rep. 43, 116 p. Texas A&M Univ., College Station, Texas.

Reports the responses of visitors, developers, and the voters of San Antonio to a recreation-business development complex along the San Antonio River in downtown San Antonio, Texas. Visitors describe the river-oriented development as beautiful, uncrowded, safe, and non-commercial. They claim it offers opportunities for a variety of leisure pursuits such as solitude, excitement, and sightseeing. Developers see the development as an informally designed landscape with provisions for many activities (business and recreation). Voters feel the development is a tourist attraction, is safe and clean, and they favor expanding the river development even if taxes would have to be raised to help pay for it.

Gunn, Clare A., John W. Hanna, Arthur J. Parenzin, and Fred M. Blumberg. 1974. Development of criteria for evaluating urban river settings for tourism-recreation use. Texas Water Resour. Inst., Tech. Rep. 56, 98 p. Texas A&M Univ., College Station, Texas.

Develops criteria to enable cities to evaluate the potential for business-recreation development along downtown waterfront locations. Suggests that development will stimulate revival of downtown areas and will allow diverse interests to coordinate leadership on resource management. Examples of waterfront redevelopment in various American cities are presented.

Gunn, Clare A. 1977. Urban rivers as recreation resources. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 19-26. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Cites examples of current recreational developments of urban waterways: San Antonio River Walk, Wichita River Parkway, Trent-Severn-Rideau Waterway (Ontario), and New York State Canal Recreation Development Program. Documents benefits: protection of natural amenities, revitalization of downtown, provision of leisure activity, and increases in jobs, incomes, and taxes generated through commercial enterprises related to development.

Hamill, Louis. 1977. Methods used for evaluating recreational rivers in Canada. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 273-278. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Reviews techniques for describing and evaluating recreational rivers in Canada. Considers methods developed and/or tested in Canada and methods developed elsewhere that have been applied in Canada.

Hastings, V. S. 1970. "Quality of the Recreation Experience-- Estimation of Its Benefits." In Estimation of First Round and Selected Subsequent Income Effects of Water Resources Investment. Institute for Water Resources Report 70-1. Washington, D.C.: Department of the Army, Corps of Engineers, February 1970, 10-28.

Hecock, R. D., D. W. Lime, E. C. Leatherberry, and D. H. Anderson. 1976. "Rivers as Recreation Resources: A Paradigm for Needed Research and its Significance for Geographers," Proc. of the 72nd Annual Meeting of the Association of American Geographers.

Provides a review of eight key elements in the river recreation system of concern to river recreation planners, managers, and researchers. Discusses four general types of knowledge needed by planners and managers to facilitate the operation of river recreation systems. These include the river resource, baseline data on use of the rivers, impacts of river recreation use, and knowledge on how managers and planners interact with a river recreation system.

Helleiner, F. A. 1972. "A Geographical Interpretation of Recreational Waterways with Special Reference to the Trent-Severn Waterway." Ph.D. thesis, University of Western Ontario. (Microfilm copy, National Library of Canada, Ottawa).

Study isolates pertinent spatial and recreational characteristics of small waterways related to boating. Utilizes unpublished data on the Trent-Severn Waterway in Ontario to establish elements of a descriptive model suitable for general application. The topological unity of the Waterway at various levels of navigability and its dendrite, quasi-linear form are established and described using a variety of indices derived from graph theory. Further, the Waterway is divided into functional regions based upon boating destinations. Boat and boater characteristics are shown to differ considerably among regions. (Abstract from Dooling, 1975, p. 7).

Herrington, Roscoe B., and S. Ross Tocher. 1967. Aerial photo techniques for a recreation inventory of mountain lakes and streams. USDA For. Serv. Res. Pap. INT-37, 21 p. Intermt. For. Range Exp. Stn., Ogden, Utah.

Describes the results of aerial photo techniques tested on the north slope of the Uinta Mountains in Utah to measure physical characteristics of mountain lakes and streams. Compares the accuracy of photo determination with field measurements of lake depth. Describes procedures for all-photo measurements in the inventory. Concludes that a substantial amount of descriptive data can be obtained from aerial photos.

Hinote, Hubert. "The Evolution of Methods Used in Evaluating Recreational Benefits of Multiple-Purpose Water Resource Projects." Unpublished paper prepared for the Navigation Economics Branch, Division of Navigation Development, Tennessee Valley Authority, Knoxville, August, 1967.

Hocking, Kenneth B. "Evaluation of Recreational Development on Selected Major Water Impoundments in Eastern Oklahoma: An Economic Geography Study." Indiana University of Pennsylvania, 1966.

* Hooper, R. A. 1977. Assessing the recreational potential of waterways: a description and evaluation of selected systems. Res. Pap. 77-1, 51 p. Navigable Mt. Rivers Study, Nat. Hist. Res. Div., Parks Canada, Western Region, Calgary, Alberta.

Describes and evaluates systems suitable for measuring the recreational potential of waterways--particularly canoeing, kayaking, rafting, and activities associated with these forms of recreational boating. These systems were tested on the Gammon River in Manitoba in 1974.

Hooper, R. A. 1977. A guide to the nature of mountain rivers and whitewater. Res. Pap. 77-2, 31 p. Navigable Mt. Rivers Study, Nat. Hist. Res. Div., Parks Canada, Western Region, Calgary, Alberta.

Acquaints the reader with some aspects of mountain river hydrology, channel morphology, and the hydraulic principles affecting whitewater features. Also, briefly discusses a system developed to rate the paddling difficulty of whitewater.

Hooper, R.A. 1978. "River Recreation Planning:
Assessing the Recreational Potential of Rivers."
Proc. of the Wildland Recreation Conference.
Banff, Alberta.

Hooper, R. A. 1977. A system to inventory and evaluate mountain rivers for canoeing and kayaking: a basis for the determination of recreational potential. Res. Pap. 77-3, 70 p. Navigable Mt. Rivers Study, Nat. Hist. Res. Div., Parks Canada, Western Region, Calgary, Alberta.

Outlines the steps taken to determine the recreational potential of several Canadian mountain rivers. First, a detailed inventory and evaluation of the rivers was completed. Then, management and operational guidelines pertaining to canoeing, kayaking, and rafting were developed. General management concerns included: requiring registration systems, establishing public safety programs, establishing recreational carrying capacity limits and procedures, establishing restrictions and guidelines for on-shore activities related to boating, and assessing public information requirements. Also river users should be surveyed to help develop the management plans. A questionnaire used for this purpose on Canadian rivers is presented.

HOOPER, R. A.

1979. THE NAVIGABLE MOUNTAIN RIVERS STUDY: SUMMARY AND CONCLUSIONS.

116 P. NATURAL HISTORY RESEARCH DIVISION, WESTERN REGION
PARKS CANADA, CALGARY, ALBERTA, CANADA.

SYNTHESIZES SEVENTEEN REPORTS WHICH WERE PREPARED DURING A FIVE YEAR STUDY ON THE CANOEING AND KAYAKING POTENTIAL OF CANADIAN RIVERS IN WESTERN REGION NATIONAL PARKS. THE STUDY INVOLVED THREE PHASES: 1) RIVERS WITH HIGH POTENTIAL WERE SELECTED AND FROM THE INITIAL 44 RIVERS OR RIVER SEGMENTS, 8 WERE SELECTED FOR FURTHER STUDY, 2) THE 8 RIVERS WERE ASSESSED IN DETAIL AS TO THEIR RECREATIONAL POTENTIAL AND AN EVALUATION FORM RATING 10 COMPONENTS WHICH AFFECT RECREATIONAL POTENTIAL AND A DETAILED RESOURCE ATLAS WERE PREPARED FOR EACH RIVER, 3) THE DEVELOPMENT OF OPERATIONAL AND MANAGEMENT GUIDELINES FOR THE 8 RIVERS.

Kalter, Robert J. 1971. The Economics of Water-Based Outdoor Recreation: A Survey and Critique of Recent Developments.
Ithaca, New York: Cornell University, March 1971.

Keith, L. B. 1964. "Some Social and Economic Values of the Recreational Use of Horicon Marsh, Wisconsin." Research Bulletin 246. Madison, Wisconsin: University of Wisconsin, January 1964.

Kelly, William F. 1970. Interrelationships among water-based recreation areas. In Western agricultural economics recreation Proc., p. 129-133. Oregon State Univ., Corvallis, Oregon.

Study on three Nevada lakes--Lake Tahoe, Pyramid Lake, and Lahontan Reservoir--to determine interrelations of demand for water-based recreation for specific sites. Author concludes that distance might not be a reliable substitute for price and that distance variables may often be highly interrelated. Suggests that other methods should be investigated in any further attempt to measure demand and demand interrelations for recreation areas. States that research should be conducted to measure recreational activities separately rather than as a whole because activities could be competitive.

Libby, David. 1975. The recreational potential of selected rivers in New Brunswick. 78 p. Plann. Sect., Tech. Serv. Branch Dep. Tourism, Fredericton, New Brunswick.

Uniqueness ratios were calculated for 18 rivers in New Brunswick using Leopold's basic concept. Rivers were ranked on quality, aesthetic appeal and human interest and total attractiveness. User conflicts related to recreation canoeing and associated activities were identified. The river's natural attractiveness, scope of significance, average canoeability, and the apparent likelihood of misuse were considered and each of these factors were rated and summed.

Lime, David W. 1969. Wilderness-like recreation opportunities adjacent to the Boundary Waters Canoe Area. *Naturalist* 20(1):36-41.

Suggests there are numerous wilderness-like recreation opportunities adjacent to Minnesota's Boundary Waters Canoe Area in the remainder of the Superior National Forest. If these opportunities were made known to potential recreation campers to northeastern Minnesota, demand and overuse in some portions of the Area could be substantially lessened. Notes the implications of these findings to water-based recreation management generally. Discusses some of the kinds of information needed to help recreation users choose among alternative areas and sites within areas.

1969 Wilderness-like recreation opportunities adjacent to the Boundary Waters Canoe Area. *Naturalist* 20(1): 36-41.

"Suggests there are numerous wildernesslike recreation opportunities adjacent to the Boundary Waters Canoe Area in the remainder of the Superior National Forest. If these opportunities were made known to potential recreation campers to north-eastern Minnesota, demand and overuse in some portions of the BWCA could be substantially lessened. Discusses some of the kinds of information needed to help recreationists choose among alternative areas." (Stankey and Lime, 1973).

MacConnell, William P., and G. Peter Stoll. 1968. Use of aerial photographs to evaluate the recreational resources of the Connecticut River in Massachusetts. Holdsworth Nat. Resour. Cent. & Exp. Stn., Coll. Agric. Bull. 578, 65 p. Univ. Massachusetts, Amherst, Massachusetts.

Develops and tests aerial photographic techniques on the Connecticut River to identify and classify river-oriented recreation sites. Analyzes two sets of aerial photos for land uses and development trends. Identifies 102 land use types, and presents a statistical summary of the land (by political unit) for analyzing the recreation potential of the River.

- . MacConnell, William P., and H. Ross Pywell. 1969. Use of aerial photographs to evaluate the recreational resources of the Connecticut River in Connecticut. Coll. Agric. Exp. Stn., Bull. 574, 73 p. Univ. Massachusetts, Amherst, Massachusetts.

Develops and tests aerial photographic techniques for identifying and classifying river-based recreation sites on the Connecticut River. System is used to describe and to note changes in vegetation and land use characteristics.

Macconnell, Use of aerial photographs to evaluate the recreational resources of a river. 1972.

Univ. of Massachusetts Agricultural Experiment Station, Amherst, Mass.
areial phogrammetric techniques, classification, land use changes since 1952, Connecticut River.

U.S. Dept. of Agriculture
14th st. and Jefferson Drive. S.W.
Washington D.C. 20250
(202) 388-5247

MacConnell, W.P. and P. Stoll, 1969. "Evaluating Recreational Resources of the Connecticut River." Photogrammetric Engineering. July.

Describes aerial photogrammetric techniques which were developed and tested for identifying and classifying river-based recreation sites. A basis for classifying: agricultural and open lands; forest lands; wetlands; mining, exposed rock on waste disposal areas; urban land use; outdoor recreation facilities; and river bank lands is provided. The study demonstrates the feasibility of analyzing the recreational potential of large rivers from aerial photographs.

McLaughlin, G. & Blair, J. It Lends Itself Naturally - A Study of the Leeds and Liverpool Canal as a Recreational Resource. British Waterway Board. London, 1974.

MCNEILL, RICHARD E
1973. INVESTIGATIONS IN THE DEVELOPMENT OF TECHNIQUES OF
MEASURING AND ANALYZING DATA OF RIVER RECREATION USERS BY
AERIAL AND GROUND METHODOLOGY.
31 P. BIOL. DEP., FERRIS STATE COLLEGE, BIG RAPIDS,
MICHIGAN.

REPORTS THE RESULTS OF A PROJECT TO EXPLORE THE POTENTIAL OF
USING AERIAL TECHNIQUES TO INVENTORY WATERCRAFT USE ON THE
PINE, MANISTEE, PERE MARQUETTE, AND AUSABLE RIVERS IN
MICHIGAN. THE VARIOUS TYPES OF AERIAL RECORDING METHODS
EXPERIMENTED WITH WERE A SIMPLE HAND-HELD MECHANICAL
COUNTER, VIDEO TAPING AND 35 MM STILL PHOTOGRAPHS USING
BLACK AND WHITE AND COLOR FILM. GROUND COUNTS USING VIDEO
TAPING, PHOTOGRAPHS AND VISUAL OBSERVATIONS WERE MADE ON THE
PERE MARQUETTE RIVER TO COMPARE WITH AERIAL DATA DURING HIGH
USE PERIODS AND TO COLLECT INFORMATION ON THE ACTIVITIES OF
THE RIVER USERS. PRESENTS THE DATA OBTAINED AND DISCUSSES
THE IMPLICATIONS. EVALUATES THE AERIAL TECHNIQUES FOR
COLLECTING RIVER USE DATA.

Merewitz, Leonard. 1966. Recreational benefits of water resource development.
Water Resour. Res. 2(4):625-640.

A pilot test of a demand model to measure recreationists' willingness to pay for various activities (boating, fishing, etc.) was conducted at Lake of the Ozarks in Missouri. The test identified four factors as necessary components of the demand model: population, population density, distance from the recreation site, and mean income of recreationists. Factors such as mobility and availability of alternative recreational activities did not appear to be useful factors for this model.

Midwest Planning and Research, Inc. A Survey and Analysis of 24 Rivers in Minnesota. St. Paul, Minnesota: Midwest Planning and Research, Inc., September, 1966.

Moncrief, Lewis, and Jan Canup. 1974. Forgotten rivers. Parks and Recreation 9(10): 30-33, 68, 70, 72, 74.

The authors argue that the potential of urban rivers for recreational purposes has not been fully realized. Cites the importance of public opinion in urban river reclamation. Urges development of riparian corridors to take advantage of rejuvenated waters. Discusses efforts in Delaware and Texas to implement greenways along urban rivers.

Morse, Eric W. Fur Trade Canoe Routes of Canada/ Then and Now. Roger Duhamel frsc. Queen's Printer and Controler, Ottawa, Canada. 1965. 125 p.

Murdock, Stratford. "The Recreation Potential of Utah's Dixie." University of Utah, 1968.

Murray, Malcolm A. "The Recreational Possibilities for the North Branch of Thames, Ontario, Canada." Syracuse University, 1950.

Michalson, Edgar L., and Joel R. Hamilton. 1973. Summary report for a methodology study to develop evaluation criteria for wild and scenic rivers. Scenic River Study Rep. 10, 185 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Nash, Roderick. 1977. River recreation: history and future. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 2-7. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The recent rise of interest in river recreation must be seen against a background of fear of wild rivers as part of the uncontrolled wilderness. Revolutions in ideas, equipment, and technique paved the way for the transformation of river running from a high-risk expedition to family fun. Suggests the future will see increasing competition for the recreational potential of rivers, particularly for float trips.

State of Ohio, Dept. of Natural Resources. Tuskarawas River and Ohio and Erie Canal Recreation and Development Study. June 1970 prepared by: Stanley Consultants, Cleveland, Ohio. 40p
Copy location ARC Branch 23 Floor

Ontario Ministry of Natural Resources.
1976. Waterway parks: evaluation of
recreation potential. 19 p. Syst.
Plann. Sect., Div. Parks, Toronto.

Proudfoot, James A. "Some Aspects of the Recreational Geography of the
North Saskatchewan River Valley--Edmonton." University of
Alberta, 1965.

Reed, David J. 1976. The San Antonio River Walk: a user and environmental analysis.
J. Soil Water Conserv. 31(1):28-30.

Reflects on the impact and effect of urban water development on users. Generally, user
attitudes to urban river development are positive. Suggests diversity in design and
development for success of urban river walkways.

Romm, Jeff. 1969. The Value of Reservoir Recreation. Cornell
Water Resources and Marine Sciences Center, New York. Technical
Report No. 19. Springfield, Virginia: NTIS, August 1969.

Rump, P. C. "Outdoor Recreational Potential and Development in the Bow and
Kananaskis Valleys." University of Calgary, 1967.

Swanson, Earl J., Jr. 1970. The archeological resources of the Salmon River Canyon:
a methodology study to develop evaluation criteria for wild and scenic rivers. 19 p.
Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Investigates the scientific and historical value of antiquities in the Salmon River Canyon.
The Canyon shows evidence of a lengthy intercultural period and a rich history of man-
environment relations. Discusses archeologically significant finds within the Canyon;
past archeological research; funding problems; and time commitments required in archeological
research. Has implications for interpretive management.

C.S. Saladino, University of Nevada
Recreational Potential of the Truckee River Basin from
Lake Tahoe to Pyramid Lake.

visual survey, design alternatives, recreational
master plan, photos, motion through landscape
1969C

University of Nevada
Agricultural Experiment Station
Reno, Nevada 89507

SCHREYER, RICHARD, NIELSON, MARTIN L.
1978. WESTWATER AND DESOLATION CANYONS: WHITEWATER RIVER
RECREATION STUDY.
196 P. INSTITUTE FOR THE STUDY OF OUTDOOR RECREATION AND
TOURISM, DEP. FOR. AND OUTDOOR RECREATION, COLL. NAT.
RESOUR., UTAH STATE UNIV., LOGAN, UTAH.

Seneca, J. 1969a. "Water Recreation, Demand and Supply." Water
Resources Research, 5: 1177-1185.

SMITH, DANIEL S.
1974. ANALYZING NEW YORK STATE STREAMS FOR POSSIBLE
INCLUSION IN THE STATE WILD, SCENIC AND RECREATIONAL RIVER
SYSTEM.
NAT. RESOUR. RES. SERIES 5, 109 P. DEP. NAT. RESOUR.,
CORNELL UNIV., ITHACA, NEW YORK.

INTENDED TO SERVE AS A GUIDE TO PRIVATE INDIVIDUALS AND
GROUPS CONDUCTING DETAILED STUDIES ON NEW YORK RIVERS TO
NOMINATE THEM FOR POSSIBLE INCLUSION IN THE NEW YORK STATE
WILD, SCENIC AND RECREATIONAL RIVERS SYTEM. PROVIDES STATE
RECOMMENDED GUIDELINES FOR RIVLR INVESTIGATION FROM THE
RESEARCHING TO THE DEVELOPMENT OF A COMPLETE RIVER STUDY.
ALSO DESCRIBES ALTERNATIVE METHODS OF STREAM PRESERVATION.
APPENDICES INCLUDE A REPORT OUTLINE FOR THE STUDY RIVER
REPORT AND EXAMPLES OF RIVER STUDY FORMS.

Shane, Richard M. 1974. Riverine recreational development; mathematical modeling. final report. R74-6, 109 p. Dep. Civil Eng., Carnegie Inst. Tech., Carnegie-Mellon Univ., Pittsburgh, Pennsylvania.

Using a computer simulation model of water quality factors, a method was developed for assessing alternative urban riverine sites for recreation. The model gives statistical summaries of simulated water quality that can reflect changes in adjacent land use patterns and socio-economic characteristics of the landowners. Other modeling techniques used to estimate urban recreational use are also discussed. Evaluates the recreational potential for noncontact activities on the Allegheny River through Pittsburgh.

Shechter, Mordechai. 1975. Simulation model of wilderness-area use: model-user's manual and program documentation. 172 p. Resources for the Future, Inc., Washington, D.C.

Smith, V. Kerry. 1975. The estimation and use of models of demand for outdoor recreation. In Assessing demand for outdoor recreation, National Academy of Sciences. 123 p. U.S. Govt. Print. Off., Washington, D.C.

Terry, Claude E. 1977. A filter system for determining river suitability for National Wild and Scenic River status. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 372-379. North Cent. For. Exp. Stn., St. Paul, Minnesota.

A system of filter matrices is described and its application to rivers in the Appalachian plateau evaluated. Based upon subsequent aerial observation and input from users, the system appears applicable in identifying streams that could logically be considered for inclusion in the National Wild and Scenic River System.

Stoevener, H. H. and W. G. Brown. 1967. "Analytical Issues in Demand Analysis for Outdoor Recreation." A Discussion by B. Delworth Gardner in Journal of Farm Economics, 49: 1295-1306.

Stott, C. C. 1967. Criteria for Evaluating the Quality of Water Based Recreational Facilities. Water Resources Research Institute, University of North Carolina. 88 p.

Stott, Charles C. Evaluating Water Based Recreation Facilities and Areas. Management Aids Bulletin Number 70. Washington, D.C.: National Recreation and Park Association, 1967.

Ad Hoc Water Resources Council. 1962. "Evaluation Standards for Primary Outdoor Recreation Benefits." Supplement to Senate Document No. 97 of the 87th Congress, Policies, Standards, and Procedures in the Formation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources. U.S. Executive Ad Hoc Water Resources Council, May 29, 1962, June 4, 9.

U.S. Army Engineer District, Sacramento, California. 1976. Analysis of supply and demand of urban oriented nonreservoir recreation. IWR Res. Rep. 76-R2, 46 p. Appendix Inst. Water Resour., Fort Belvoir, Virginia.

Presents the results of research into the supply and demand of urban oriented nonreservoir recreation. Provides a detailed account of the data base used, the methods of collecting the data, and the analytical procedures followed in developing various recreation use prediction models. Recommends that the methods described be tested elsewhere, evaluated, and developed into a standardized procedure for use by the U.S. Army Corps of Engineers.

U. S. Bureau of Outdoor Recreation. Tourist and Recreation Potential: Lafayette and Suwanee Counties, Suwanee River Area, Florida. Washington, D.C.: Government Printing Office, 1964.

United States Bureau of Outdoor Recreation. 1964. An economic and social evaluation of establishing portions of the Salmon and Clearwater Rivers (Idaho) as Wild Rivers. Prepared by Battelle Memorial Inst., Contract No. 2-63 for USDI Bur. Outd. Rec., Wash., D.C., 76 p. + append.

Abstract: Three sections of two rivers, the Salmon and the Selway, of central Idaho were identified as suitable for wilderness river recreation. To permanently allocate these river sections to the recreational purpose would mean (a) banning man-made developments from the river and a strip of land extending two miles inland from each bank, and (b) exercising control over use of the river and surrounding corridor. Before this allocation can be justified, it was deemed necessary to (1) examine the natural resources involved, (2) analyze the alternative needs for these resources, and (3) evaluate the consequences of allocating the river resources to the alternative needs. In this study, features of the river sections are described and evaluated in the context of four issues: the national need for wild river recreation; the regional need for electrical power; the regional need for salmon spawning areas; and the local need for economic growth resources. Recommendations included: (1) wild river designation be given to the three wild river sections and appropriate control measures be applied; (2) wild river designation be accompanied by general recreation development plan, for optimum utilization of the entire area's resources; and (3) forestry as an industry continue to receive support as a vital alternative and supplement to recreation to enhance local economic growth.

Keywords: Waterway Evaluation, Economics Analysis, Wild Rivers, Idaho, Hydro-Electric Power, Use Conflicts, Recreational Potential.

U. S. Bureau of Outdoor Recreation. Tourist and Recreation Potential: Upper Cumberland Lakes Area of Tennessee. Washington, D.C.: Government Printing Office, 1965.

U.S. Department of Agriculture, Soil Conservation Service. 1966. Guide to Making Appraisals of Potentials for Outdoor Recreational Developments.

United States Department of Agriculture, Soil Conservation Service. 1966. Guide to Making Appraisals of Potentials for Outdoor Recreation Developments.

U.S. Department of Agriculture, Forest Service. 1974b. Recreation opportunity inventory and evaluation. 76 p. Div. Nat. Resource, North. Reg., Missoula, Montana.

U. S. Outdoor Recreation Resources Review Commission. Water for Recreation-Values and Opportunities. Study Report No. 10. Washington, D.C.: U. S. Government Printing Office, 1962.

Vernon, James Y. "Water Supply and Recreation in the Upper Basin of the Tuolumne River, California." U.C.L.A., 1951.

Wennergren, E. B. and Darwin B. Neilsen. 1970. "Probability Estimates of Recreation Demand." Journal of Leisure Research, 2: 112-122.

WILLIS, ROBERT L.
1974. A DETERMINATION OF RECREATIONAL USE AND POTENTIAL OF
SELECTED KENTUCKY WATER COURSES AND ADJACENT HABITATS.
PITTMAN-ROBERTSON GAME MANAGEMENT TECH. SERIES NO. 20, 67 P.
KENTUCKY DEP. FISH AND WILDL. RESOUR., FRANKFORT, KENTUCKY.

PRESENTS THE RESULTS OF A STUDY TO TEST RECREATIONAL
INVENTORY TECHNIQUES AND ESTIMATE PRESENT AND POTENTIAL
RECREATIONAL USE ON THE GREEN AND ROCKCASTLE RIVERS OF
KENTUCKY. THREE INVENTORY TECHNIQUES WERE EVALUATED BY A
QUESTIONNAIRE SURVEY AND THE DATA USED TO GIVE ESTIMATES OF
PRESENT ANNUAL USE AND EXPENDITURES FOR THE 2 RIVERS.
POTENTIAL ANNUAL USE AND EXPENDITURES WERE ESTIMATED BY A
PHYSICAL HABITAT EVALUATION.

Zube, E. and H. Dega. 1964. Wisconsin's Lake Superior Shoreline.
Madison, Wisconsin: Zube and Dega Associates.

Describes one of the earlier methodologies which utilized shoreline characteristics to assist in the determination of recreational potential. Based upon the visible and physical features, a thirteen part shoreline typology was developed. The typology identifies: the slope and material of the wet beach, dry beach, bluff and upland areas, evidence of erosion, type of vegetation, and types of soil. An inventory of the entire Lake Superior shoreline was undertaken and optimum uses for each shoretype were recommended.

D. ASSESSMENT OF ENVIRONMENTAL INTANGIBLES

Alexander, Harold E. 1965. The state's role in stream preservation. *Naturalist* 16(3):26-29.

Suggests that stream preservation efforts are based on perpetuation of intangible values, both aesthetic and scenic, that contribute to the scope and quality of the human environment. Believes previously used criteria for assigning values to intangibles are inadequate because States continue to lose ground to development interests.

Arthur, Louise M., and Ron S. Boster. 1976. Measuring scenic beauty: a selected annotated bibliography. USDA For. Serv. Gen. Tech. Rep. RM-25, 34 p. Rocky Mt. For. and Range Exp. Stn., Fort Collins, Colorado.

Contains 167 references, most of which date from 1965. Papers are categorized into: (1) literature review, (2) inventory methods, (3) public involvement, or (4) miscellaneous. Many annotations include a "critical comment".

British Waterways Board. Waterway Environmental Handbook. London, 1972.

Canada Dept. of Indian Affairs and Northern Development. 1972. Wild rivers survey, 1971 - quantitative comparison of river landscapes. DIAND Natl. & Hist. Parks Br., Planning Div., Ottawa. unpubl. special report #72-1, 29 p.

Abstract: Discusses Luna Leopold's methodology for quantitatively evaluating wild rivers. This method was used in the 1971 pilot project in the Yukon Territory. Includes discussion of the concept of wild river evaluation, how Leopold's technique was chosen, the study area, and the application of the technique during the pilot study, and concludes with recommendations concerning changes in the technique for follow-up river surveys.

Keywords: Wild Rivers, Waterway Evaluation, Yukon Territory.

1973a.. Wild rivers survey, 1972 - summary report. DIAND Natl. Hist. Parks Br., Planning Div., Ottawa. unpubl. special report #73-3, 65p., illus.

In the summer of 1972, 3,300 miles of Canadian "wild" rivers were surveyed from the Yukon Territory to Newfoundland and Labrador. The rivers were chosen on the basis of: (1) National Park Natural Region representation (National Park System Planning Manual) in terms of Canada's 39 natural regions; (2) historic routes; and (3) simplicity of studying those rivers which could be feasibly examined from the study centre in one field season. Reports on each river include a written descriptive section and a quantitative inventory/analysis section. This second summer continued to apply a modified version of Leopold's technique for evaluating wild river sites. This summary report includes an outline of the major geographic, historical, recreational, etc. features of the rivers studied during the summer of 1972. The quantitative inventory is not included. (note: a summary report of the 1973 wild rivers survey will be completed during this spring, 1974. The summer of 1973 was the third and last field study of wild rivers for the time being. The analysis of the quantitative data will be the focus of attention during the ensuing months. In addition to the three summary reports, there is an unpublished special report concerning each study river.).

Coomber, Nicholas H., and Asit K. Biswas. 1973. Evaluation of environmental intangibles. 74 p. Genera Press, Bronxville, New York.

Reviews the state of the art of evaluating intangible benefits and costs associated with the use of the environment. Cites Leopold's inventory technique to assess environmental quality of rivers as being more illustrative rather than analytic. Distinguishes between two types of classification techniques: monetary evaluations of environmental intangibles and nonmonetary evaluations of the physical environment.

Dearinger, John A., and George M. Woolwine. 1971. Measuring the intangible values of natural streams: Part I--applications of the uniqueness concept. Res. Rep. 40, 86 p. Water Resour. Res. Inst., Univ. Kentucky, Lexington, Kentucky.

Applies Leopold's river inventory system for uniqueness to 58 natural streams in Kentucky. Concludes that the concept is useful to evaluate the uniqueness of a group of streams. Encourages further integration of the uniqueness concept into benefit-cost analysis and makes specific recommendations for further research.

Dearinger, John A., George M. Woolwine, Charles R. Scroggin, D. Daland, and J. Calvin. 1973. Measuring the intangible values of natural streams: Part II--preference studies and completion report. Water Resour. Res. Inst. Res. Pap. 66, 206 p. Univ. Kentucky, Lexington, Kentucky.

A method that utilizes color slides and a semantic differential rating scheme was developed to measure people's preferences for natural landscapes. Concludes that: scenes with running water are preferred over scenes with still or no water; stark beauty of a desert, lava flow, or winter pasture is not perceived as beauty by most people; some types of visual pollution (i.e., billboards) are not recognized as such by many people; occupation and lifestyle have more of an effect on an individual's concept of natural beauty than does age or sex; and people generally agree on what is very beautiful or very ugly but not on the in-between.

"Environmental Impact Analysis: Philosophy and Methods."
Proceedings of the Conference on Environmental Impact Analysis,
Green Bay, Wisconsin, January 4-5, 1972. NTIS, COM-72-10806,
\$3.00. 35.

Fabos, J.G. 1971 "An Analysis of Environmental Quality Ranking
Systems." Recreational Symposium Proceedings
Upper Darby, Pa: U.S. Department of Agriculture,
Northeast Forest Experiment Station.

Fabos, J. G. 1971. "An Analysis of Environmental Quality Ranking Systems."
Recreation Symposium Proceedings. Upper Darby, Pa.: U. S. Department of
Agriculture, Northeast Forest Experiment Station. 40 - 53.

Paper provides a review and analysis of quantitative ranking systems developed during the 1960's for measuring environmental quality. Includes consideration of systems to evaluate resources for policy planning, planning decisions. and for single uses.

Frissell, Sidney S., Jr., and George H.
Stankey. 1972. Wilderness environ-
mental quality: search for social and
ecological harmony. In Soc. Am. For.
Proc., Hot Springs, Arkansas. p.
170-183.

Gauger, Stephen E. and J. B. Wyckoff. "Aesthetic Preference for Water Resource Projects: An Application of Q Methodology." In Water Resources Bulletin, Vol. 9, No. 3. June 1973, pp. 522-528.

Gerney, James. Landscape Amenity Assessment Bibliography. Council of Planning Librarians, Exchange Bibliography #287, 1972.

Hamill, Louis. 1975. Analysis of Leopold's quantitative comparisons of landscape aesthetics. J. Leisure Res. 7(1):16-28.

In 1969 Luna B. Leopold published a system for quantitatively comparing landscape aesthetics. This system had several features such as the uniqueness ratios and distinctive graphical procedures for deriving river and valley character. An examination of Leopold's checklist for landscape factors reveals that the system for rating each factor is inconsistent. Inconsistency is justified as not introducing bias and personal preferences into the analysis. The use of uniqueness ratios appears to have been required in order to accommodate the inconsistent scaling of factors to numerical analysis. The addition of uniqueness ratios produces difficulties of comprehension and interpretation. The graphical procedures use a small amount of information and complex graphical techniques to produce scales of river and valley character. Analysis of the system suggested that consistent rating of environmental factors and the addition of factor scalings might have produced comparable results more effectively.

Hamill, Louis. 1974. Statistical test of Leopold's system for quantifying aesthetic factors among rivers. Water Resour. Res. 10(3):395-401.

Criticizes Leopold's inventory method to quantify the aesthetic factors of rivers. Statistical tests show small correlation between uniqueness ratios in Leopold's method and other rating methods. Anomalies were also found in graphic derivation of Leopold's technique. Suggests that a number-ranking system would be a more efficient evaluation tool.

Horn, Thomas F. 1978 "Significance of the Chautagua Lake (N.Y.) muskellunge fishery to regional tourism in 1975," Cornell University MS Thesis 121p

Jacobs, Peter. 1973. The landscape image:
a comparative study of existing analysis
methods and an initial visual survey of
the Chambly Canal. 68 p. Proj. 90/4
C.2. Cont. 72-157. Parks Canada, Ottawa.

Jordening, David L. 1974. "State-of-the-Art: Estimating Benefits
of Water Quality Enhancement." Office of Research & Monitoring,
U.S. Environmental Protection Agency, Contract #68-01-0744.

Juurand, P. 1972. "Wild Rivers Survey, 1971 - Quantitative Comparison of
River Landscapes." Canada Department of Indian and Northern Development.
National and Historic Parks Branch, Planning Division, Ottawa. unpub.
special report 72 - 1. 29 p.

Provides a discussion of the conceptual and methodological aspects
of the Leopold Inventory Technique. Included is a discussion of the
rationale for selection of the technique. An analysis of quantitative
data collected during the first summer of field work is made. Results
indicated that modifications in the factors considered and sample
design were required. Modifications were related to the determination
of scores based on factors having direct relevance to aesthetic
appeal and calculation of desirability scores. The paper concludes
with recommendations concerning other required changes in the
methodology.

Juurand, Priidu. 1972. Wild rivers survey 1971: quantitative comparison of river land-
scapes. Spec. Rep. 72-1, 29 p. Can. Dep. Indian Aff. North Dev., Natl. Hist. Parks
Branch, Plann. Div., Ottawa, Canada.

Reviews wild river evaluation techniques and selects a modified version of Leopold's inven-
tory method to use in collecting data on Canadian rivers. Recommends that historical, geo-
logical, biological, and recreational capability information be added to the inventory tech-
nique. Field test concludes Lewes-Yukon and Ogilvie-Peel Rivers as high-priority considera-
tions for Canadian wild and scenic river status.

JOURARD, P. (1973) Perception of Quality of Wild Rivers, Canadian Outdoor Recreation Demand Study, Technical Note 27, Ottawa: Lands Directorate, Environment Canada. (typescript, draft), 51pp.

OBSERVATION

RIVERS

Teams were sent out in canoes along selected rivers and, at a sample of points, measured and assessed a number of resource variables - e.g. depth of water, gradient, velocity, turbulence, density of flora, etc. - and gave an overall assessment of quality on a 1-10 scale. With the resource variables as independent and the overall assessment as dependent variable three methods of analysis were used to explore the relationships: multiple linear regression, analysis of variance model, and an Automatic Interaction Detector model. The third approach was most satisfactory, explaining 76% of the variance. It is concluded that such a model could be used to predict site quality from purely physical resource data, for use in planning contexts.

Kavanagh, N.J. & Smith R.J. "The Measurement of Benefits of Trout Fishing: Preliminary Results of a Study at Grafham Water" Journal of Leisure Research 1(4) 1969
An empirical, Clawson style demand curve for and rent fishing based upon data relating to Scotland Water, Rutington, England

Krutilla, John V. 1970. Evaluation of an aspect of environmental quality. Soc. Stat. Sect. Proc. 1970:198-206.

Reports on a study to aid resource allocation decisions involving amenity aspects of the river environment of Hell's Canyon on the Snake River in Idaho. A comparative evaluation of the unique geomorphologic-hydrologic characteristics of the site and hydro-electric alternatives is made. Introduces a means of quantifying the costs and benefits of preserving the Canyon.

Linton (D) "The Assessment of Scenery as a Natural Resource" Scottish Geographical Magazine, 84(3), 1968 219-238

Lowenthal D, "Not every Prospect Pleases. What is our Criterion for Scenic Beauty?" Landscape 1962-3 19-23

Leopold, Luna B., and Maura O'Brien Marchand. 1968. On the quantitative inventory of the river-scape. *Water Resour. Res.* 4(4):709-717.

Develops a way to quantify the presence or absence of factors that contribute to aesthetic values of a river landscape as expressed by a uniqueness ratio. Discusses inherent difficulties in such research but suggests that the techniques can be a valuable procedure in river-basin planning.

Leopold, Luna B. 1969. Landscape aesthetics. *Nat. Hist.* 78(8):36-45.

Discusses the development of an inventory method to compare the aesthetic uniqueness of Hell's Canyon of the Snake River in Idaho with 11 other river valleys in Idaho.

Leopold, L.B. (1969) 'Landscape Aesthetics: How to Quantify the Scenics of a River Valley', Natural History, Vol. 78, pp. 36-45 (see also Ekistics, Vol 173, pp. 271-7 and G. Ball and J. Tyrwhitt (eds.) Human Identity in the Urban Environment, Harmondsworth Middlesex, Penguin 1972 (Chapter 5 'Landscape Aesthetics', pp. 89-105).

Landscape Evaluation: A method for landscape evaluation is put forward in which 46 characteristics are measured, divided into physical, biological and water quality and human use and interest factors. Each site is given 2 score of 1-5 on each variable by the researcher/planner. The reciprocal of the total score in each group for each factor is the 'uniqueness' ratio. Adding all the uniqueness ratio's on all 46 factors gives the 'Total uniqueness ratio'. Graphical methods are then used to combine various factors to assess landscape characteristics. For example width of valley is plotted against height of mountains. The plotted points are projected into a 45 degree line, giving a new axis libelled 'landscape scale'. 'Scenic outlook' is plotted against this to provide yet another 45 degree scale and so on.

Leopold, Luna B. 1969. Quantitative comparison of some aesthetic factors among rivers. USDI Geol. Surv. Circ. 620, 16 p. Washington, D.C.

Develops a quantitative inventory and evaluation technique based on the assumption that a unique landscape has more significance than a common one. Defines the physical, biological, and cultural characteristics of 12 Idaho rivers and 4 National Park rivers in terms of 46 variables. A measure of uniqueness is derived by summing the calculated ratios for each variable.

Leopold, Luna B. 1969. Quantitative comparison of some aesthetic factors among rivers. U.S. Geological Survey Circular 620, Wash., D.C., 16 p.

Abstract: A preliminary attempt to quantify some aesthetic aspects of rivers. Because the U.S. Federal Power Commission had been studying an application for a permit to construct one or more additional hydropower dams in the vicinity of Hells Canyon of the Snake River in Idaho, data were collected to provide information on factors related to non-monetary values in the region. Forty-six factors are considered in the analysis and are of three types: physical features, biologic features, and human interest factors. Each factor is evaluated on a scale of 1 to 5 for each of the 12 sites. A subsequent analysis of sites consists of two parts which determine the "uniqueness" and rank of each site. Further graphical comparison of a few selected river and valley characteristics was made with the rivers in four national parks; for the features studied, Hells Canyon was found to be "unique" and comparable only to the Grand Canyon of the Colorado River.

Keywords: Waterway Evaluation, Hydro-Electric Power, Stream Measurement, Idaho.

"A Procedure for Evaluating Environmental Impact," Luna B. Leopold, et al., U. S. Geological Survey Circular 645, 1971. 56.

Litton, R. Burton, Jr., Robert J. Tetlow, Jens Sorensen, and Russell A. Beatty. 1974. Water and landscape: an aesthetic overview of the role of water in the landscape. 314 p. Water Inf. Cent. Inc., Port Washington, New York.

Discusses the aesthetic role of water on landscape. Proposes a visual classification system for fresh water resources based on landscape, setting, and waterscape. Cites criteria for natural and man-made landscape evaluation. Recommends intra-agency adoption of aesthetic evaluation policies for water so that water-oriented landscapes may be defined and evaluated using aesthetic criteria as major tools. Encourages research that incorporates aesthetic evaluation with benefit cost analysis.

Litton, R. Burton, Jr. 1977. River landscape quality and its assessment. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-24, p. 46-54. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Illustrates the elements of visual assessment of river landscapes: (1) landforms, (2) vegetation patterns, (3) water presence and expression, (4) human use and impacts, and (5) other influences. Discusses how to inventory landscapes at large and small scales of application, and with implications of planning and design policies. Points up problems of evaluating landscape quality using criteria such as aesthetics applied to landscape, professional judgment, and perceptual studies.

Marsh, John. Scenery Evaluation and Landscape Perception: A bibliography. #304. Council of Planning Librarians, Monticello, Ill. August, 1972. 9 p. \$1.50. Copy location: Ministerial library, 14th Floor.

McPhail, M.N. Quantitative Comparison of Some Aesthetic and Recreational Factors along the Capilano River Study Area. E.S.F. Thesis, Faculty of Forestry, University of British Columbia, 1970.

Melhorn, Wilton N., Edward A. Keller, and Richard A. McDane. 1975. Landscape aesthetics numerically defined (LAND system): application to fluvial environments. Tech. Rep. 1, 169 p. Water Resour. Res. Cent., Purdue Univ., Lafayette, Indiana.

Develops a quantitative method for objectively assessing aesthetic values in a fluvial landscape. The LAND system is an extension of Leopold's river inventory scheme. Five evaluative indices are utilized to assess environmental beauty: uniqueness, aesthetic value, scenic beauty, recreation potential, and wildness. Initial testing of the system indicates that participants consistently derive similar numerical values for beauty regardless of their educational background.

Michalson, Edgar L. 1974. Aesthetics of wild and scenic rivers--a methodology approach. Scenic Rivers Study Rep. 11, 139 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho

Study focuses on two tasks: developing a method to evaluate the aesthetic value of wild and scenic rivers and developing demand models for outdoor recreation to estimate how much recreation demand is related to aesthetics. Concludes that quantification of aesthetics is an imperfect art that requires more research.

Michalson, E. L. 1977. An attempt to quantify the aesthetics of Wild and Scenic Rivers in Idaho. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 320-328. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes the procedure used to estimate demand for outdoor recreation on rivers. Also describes the development of a Likert-type scale to distribute the net resource values estimated in the demand analysis according to perceptions that users indicated as being important to the wild and scenic river experience.

. Morisawa, Marie, and Martin Murie. 1969. Evaluation of natural river environments. Final Rep., 143 p. USDI Water Resour. Res., Antioch College, Yellow Springs, Ohio.

Methods were devised to objectively identify and assess values (biological, geological, aesthetic, and recreational) of rivers in their natural, free-flowing state, and to compare these values with those of more developed rivers. Field data on fauna, flora, geology, hydrology, history, and aesthetics were collected for the Green River, Wyoming, and the Little Miami River, Ohio, to supply an inventory of features along each river. Although both rivers were considered natural and free-flowing, classification schemes and ratings for each value applied to these two rivers show sharp distinctions between them.

Morisawa, Marie. 1970. Evaluating riverscapes. *In* Environmental geomorphology. p. 91-106. Donald R. Coates, ed. State Univ. New York, Binghamton, New York.

Discusses a process to rank the intangible values of a riverscape. Reviews research in analyzing aesthetics and in quantitatively evaluating scenic beauty. Relates the pleasurable feelings of the observer in the environment to art criteria (i.e., arrangement of lines, mass, color, and space). Encourages research in methodology to predict user preferences so that riverscapes with outstanding scenic value may be preserved.

Morisawa, Marie. 1971. Evaluation of natural river environments. Phase II, Final Rep., 114 p. USDI Water Resour. Res. State Univ. New York, Binghamton, New York.

Methods of evaluating various aspects (physical, cultural, hydrologic, and aesthetic) of watersheds were tested on six rivers representing a variety of natural environments. Criteria to inventory and classify natural environments as well as methods to evaluate cultural (scenic and historic) values were identified. Application of methodology to watershed management and planning is stressed.

Murtha, P. A. and M. Greco. Appraisal of Forest Aesthetic Values: An Annotated Bibliography. Forest Management Institute Information Report FMR-X-79, Canadian Forestry Service, Ottawa, Canada, June 1975.

Nieman, Thomas J., Richard C. Viohl. The Description, classification and assessment of visual landscape quality. Exchange bibliography #1064. Council of Planning Librarians, June, 1976. 27 p.

Nighswonger, James J. 1970. A methodology for inventorying and evaluating the scenic quality and related recreational value of Kansas streams. Kansas Plann. Dev. Rep. 32, 119 p. Kansas Dep. Econ. Dev. Plann. Div., Topeka, Kansas.

Develops a technique for inventorying, evaluating, and analyzing Kansas' streams for visual quality and recreational potential. Concludes that the most significant streams, in terms of visual quality, are located in the eastern one-third of Kansas where water, topography, and vegetation combine for visual diversity.

Olson, P. 1976. "A Scenic Resource and Recreation Analysis of the Milk River Canyon, Southeast Alberta." M. A. thesis, University of Calgary. 171 p.

Presents a procedure to inventory and evaluate the scenic and recreational resources of prairie rivers. The inventory procedure considers four groups of resource components: scenery (characteristic and non-characteristic landscapes); features (geologic, geomorphologic, biologic etc.) hydrology; and shoreline characteristics. Collected data was evaluated through use of matrices showing magnitude and significance of features in the landscape, and use tolerance. Land capability classes were developed to aid in application of a land use zoning scheme.

"An Analysis of Environmental Statements for Corps of Engineers Water Projects," Leonard Ortolano, et al., Stanford University, June 1972. NTIS, Ad-747 374, \$3.00. 28.

Fesbles, J.J. A Methodology Study to Develop Evaluation Criteria for Wild and Scenic Rivers. Report of Flood Control Subject, Water Resources Research Institute, University of Michigan, February 1970.

Penning-Rowsell, E. C. and D. I. Hardy. "Landscape Evaluation and Planning Policy: A Comparative Survey in the Wye Valley Area of Outstanding Beauty." In Regional Studies, Vol. 7. 1973, pp. 153-160.

Polakowski, Kenneth J. An Aesthetic Basis for Visual Resource Analysis. Seminar paper, Impact Assessment in Water Resources Planning Seminar, sponsored by U.S. Corps of Army Engineers Institute, held at School of Natural Resources, University of Michigan, Ann Arbor, Michigan, June 1973.

Friddle, G. B. 1974. A conceptual model and field manual for the assessment of natural landscapes for byways and special places: final report. 52 p. Waterloo, Ontario.

Reetz, Gene R. Water Resources Development and Wilderness Values: A study of the Upper Madison River. Dept. of Natural Resources, Cornell University, 1975.

Sargent, Frederic O. "A Scenery Classification System." In Journal of Soil and Water Conservation, Vol. 21, No. 1. January-February 1966, pp. 26-27.

SCHIEFER, KARL, AND ROB N. DUNN

1973 Manitou. Park News. 9(1): 12-18.

An account of the wild river values of this area in Quebec between the Moisie and Sheldrake Rivers. Recommends the river wilderness for national park potential - a wild river for canoeing on a 100-mile chain of rivers and lakes.

- . Sonnen, Michael R., Larry C. Davis, William R. Norton, and Gerald T. Orlob. 1970. Wild Rivers: methods for evaluation. Final Completion Rep., 116 p. Water Resour. Eng. Inc., Walnut Creek, California.

Develops two methods of evaluating wild and scenic river potential to include intangible, nonmonetary benefit values. Each method was tested on two adjacent river basins in Washington--the Upper Skagit (a currently developed basin) and the Sauk-Suiattle (a wild river basin). The results of each test indicated that the Sauk-Suiattle River should be left wild and the Skagit River could be more fully developed.

TIPPY, ROGER

1968 Preservation values in river basin planning. Nat.
Resour. J. 8(2): 259-278.

Discusses preservation values of river basins: "recreation, fish and a set of thoroughly intangible factors incorporating wilderness, natural beauty, historic and scientific values"; and the conflicting development values: "storage for agricultural and domestic consumption, flood control, navigation, hydro-electric power, slack water recreation, and soil conservation." Introduces the formation of a "wild rivers study team" in 1963 by the U.S. Forest Service and lists five evaluation criteria regarding a river's condition, capacity, quality, highest use, and present status. Discusses several legislative steps which finally has resulted in the passage of the Wild and Scenic Rivers Act (1968).

Tippy, Roger. 1968. Preservation values in river basin planning. Nat. Resour. J. 8(2):259-278.

Three values are identified as reasons for preserving streams: recreation, fish, and a set of intangibles such as wilderness, natural beauty, and historic and scientific values. Major development values of rivers are: agricultural and domestic consumption, flood control, navigation, hydroelectric power, dams, and soil conservation. Conflicts between preservationists and developers often occur thereby establishing a need for comprehensive river basin planning. Ideally planners should either present decision-makers with a choice of alternatives for a given river or a single answer that does not dissatisfy one interest group more than another. The comprehensive planning program for the Upper Missouri River basin could guide other river basin planning efforts.

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USDI National Park Service
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USDI Preliminary Environmental Statement,
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USDA Forest Service
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USDI Environmental Assessment/River Management Plan
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Dinosaur National Monument National Park Service US Dept.
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Veal, A.J. Environment Perception and Recreation:
A review and annotated bibliography. Research
memorandum 39. Center for Urban and Regional
Studies, University of Birmingham. October,
1974. 201 p. Price 1.50 £. Copy location:
ARC library.

Vichh, Richard G. Jr. and Ianneth G.M. Mason.
Environmental Impact Assessment Methodologies:
An annotated bibliography. Council of Planning
Librarians. Exchange library #691.

This annotated bibliography presents some 78
references on environmental impact assessment.
The annotations are designed to give an objective
picture of the salient information or arguments
contained in each reference. A brief overview
comparing different concepts and methodologies
is included.

Water Resources Engineers, Inc. 1970.
Wild rivers, methods for evaluation.
106 p. Prepared for the U.S. Department
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Walnut Creek, California.

B. Wilkins, Cornell University Ithaca, N.Y.
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Upper Hudson, 1972
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agencies, environmental analysis, user survey, adirondacks
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U.S. Dept. of Interior, Office of Water Resources Research

J.W. Wwenscher. Duke University, School of Forestry, Durham, N.C.
Enviornmental considerations in land and water use planning in river
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criteria, land use, water use, classification system eno river basin,
wildland corridor
1972C
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Office of Water Resources Research
Washington, D.C.

ZUBE, E.H., PITT, D.G. and ANDERSON, T.W. (1974) Perception and Measurement of Scenic Resources in the Southern Connecticut River Valley, Publication No. R-74-1 Amherst, Mass., Institute for Man and his Environment, University of Massachusetts, pp. 191.

VARIOUS GROUPS	SEMANTIC	LANDSCAPE
OF SUBJECTS	DIFFERENTIAL.	
TOTALLING 300	PHOTOGRAPHS	
56 VIEWS		

Final report from the study reported on in Zube, et al. (1973). Following extensive tests it is concluded that photographs are reliable instruments for eliciting response to landscapes in general, but less reliable when applied to particular landscape features. The thirteen groups of subjects showed high levels of agreement in their assessments of scenic values. Twenty three 'Landscape dimensions' explained 70% of variation in preference.

Zube, E. H., R. O. Brush, and J. C. Faber,
eds. 1975. Landscape assessment:
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367 p. Dowden, Hutchinson, and Ross,
Stroudsburg, Pennsylvania.

E. ECONOMIC EVALUATION OF RIVER RESOURCES

Arnell, S. M. "An Analysis of the Water Resources of the Cowichan River Basin Vancouver Island." University of Alberta, 1967.

Bianchi, Dennis H. 1969. The economic value of streams for fishing. Res. Rep. 25, 119 p. Water Resour. Res. Inst., Univ. Kentucky, Lexington, Kentucky.

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Binkley, Clark. Estimating Recreation Benefits: A Critical Review and Bibliography, Council of Planning Librarians #1219. May, 1977. Monticello, Illinois, 35 p. \$3.50 (U.S.) Copy location: Ministerial library, 14th Floor.

Borders, Carl. "The Economic Status and Potential of Bivalve Fishing in the Wabash Valley Basin." Indiana State University, 1968.

Boster, Mark A. 1972. Colorado River trips within the Grand Canyon National Park and Monument: a socioeconomic analysis. Natural Resource Systems, Report No. 10. Tucson, Ariz.: University of Arizona, Department of Hydrology and Water Resources.

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Canion, Robert Larry, and Warren L. Trock. Input-Output as a Method of Evaluation of the Economic Impact of Water Resources Development. College Station, Texas: Water Resources Institute of Texas A&M University, 1968.

CORTELL AND ASSOCIATES, INC.
1977. RECREATION AND INSTREAM FLOW. VOLUME 1, FLOW REQUIREMENTS, ANALYSIS OF BENEFITS, LEGAL AND INSTITUTIONAL CONSTRAINTS.
96 P. BUR. OUTDOOR RECREATION, WASHINGTON, D.C.

Crutchfield, James H. "Valuation of Fishery Resources," Land Economics Journal, 37 (2) (May, 1962), 145-154.

Darling, A. H. 1973. "Measuring Benefits Generated by Urban Water Parks." Land Economics, 49: 22-34.

David, Elizabeth L. "Lakeshore Property Values: A Guide to Public Investment in Recreation." In Water Resources Research, Vol. 4, No. 4. August 1968, pp. 697-707.

Davis, Robert K. "Water Supply Economics in the Potomac River Basin." Journal, American Water Works Association, Vol. 56, No. 3, March 1954, p. 257.

Dwyer, John F. and Michael D. Bowes. "Benefit Cost Analysis for Appraisal of Recreation Alternatives". 1979. 2 pages. (includes comments by A.A. Dyer and J.G. Hof.

Dwyer, John F., John R. Kelly, and Michael D. Bowes. 1977. Improved procedures for valuation of the contribution of recreation to national economic development. Res. Rep. 128, 218 p. Water Resour. Cent., Univ. Illinois, Urbana-Champaign, Illinois.

Presents procedures for evaluating criteria for water and related land resources. Federal agencies use the interim unit day value approach almost exclusively. This approach has little theoretical or empirical justification and does not encourage efficient allocation of resources. It is recommended that models be developed to predict individual willingness-to-pay for many types of recreation as functions of site characteristics, the characteristics of the individual user, the availability of substitute activities and sites, and the location of the individual in relation to the resources under study. The total value of the resource would be a function of these variables, the number of users, and the distribution of users within the market area. These functions may be derived from regional travel cost demand functions or could be explicit willingness-to-pay functions derived from the survey method.

Gamble, Hays B. and Leland D. Megli. 1972. "The Relationship Between Stream Water Quality and Regional Income Generated by Water-Oriented Recreationists." Journal of Northeastern Agricultural Economics, 1: 265-281.

Gordon, D., D. W. Chapman and T. C. Bjornn. 1973. "Economic Evaluation of Sport Fisheries--What Do They Mean?" Transactions of the American Fisheries Society, 102: 293-298.

Gordon, Douglas. 1971. A preliminary socio-economic analysis of hunting in Salmon River Basin: a methodology study to develop evaluation criteria for wild and scenic rivers. 44 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Sociological data and management-oriented information was collected from hunters in the Salmon River Basin during the 1969 hunting season. Expenditures associated with hunting were assessed. Hunter behavior, preferences, opinions, and place of residence were determined. Concludes that hunter expenditures associated with the wildlife resources are vital to the economy of the Salmon River Basin. Any development affecting wildlife resources--providing new access roads, improving existing roads, building more campgrounds and related facilities, or allowing more outfitters and guides--would have a negative economic impact on the Basin.

Grubb, H.W. & Goodwin, J.T. 1968, Economic evaluation of water-oriented recreation in the preliminary Texas water plan, Texas Water Development Board

Herbst, John R., and Edgar L. Michalson, eds. 1969. A wild and scenic rivers symposium. July 25-27, 1969. 49 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Directs the Idaho Water Resources Institute to develop criteria for evaluating proposed rivers for inclusion in the National system. Identifies three major research areas for wild and scenic rivers studies: (1) importance of aesthetics in river evaluation; (2) development of quantitative methods to measure economic benefits and trade-offs gained from wild or scenic river status; and, (3) alternative methods of river evaluation.

Herbst, John R. 1972. Report of forest subprojects: a methodology study to develop evaluation criteria for wild and scenic rivers. 52 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Presents a timber inventory of the Salmon River basin to determine the impact that the wild and scenic river classification would have on timber harvesting activities in the area. Notes that timber-market boundaries rather than geographic boundaries are more relevant when examining and comparing the effects river classification would have on the timber industry. Concludes designation in the National Wild and Scenic River System would have little effect on timber harvesting activities.

Herbst, John R. 1973. Report of range subproject: a methodology study to develop evaluation criteria for wild and scenic rivers. Scenic Rivers Study Rep. 3, 49 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Discusses the importance of grazing in the Salmon River basin and the effects Federal wild and scenic river designation might have. Develops an evaluation method to determine the impact of designation on grazing and concludes that little conflict would exist.

Herfindahl, Orris C., and Allen V. Kneese.
1974. Economic theory of natural resources. 405 p. Charles E. Merrill Publ. Co., Columbus, Ohio.

"Future Water Demands: The Impacts of Technological Change, Public Policies, and Changing Market Conditions on the Water Use Patterns of Selected Sectors of the United States Economy 1970-1990, Charles W. Howe, et al., Resources for the Future, Inc., March 1971. NTIS, PB-197 877. 35.

Inter-Agency Committee on Water Resources. Proposed Practices for Economic Analysis of River Basin Projects. Washington, D.C.: The Committee, 1958.

Kalter, R.J. 1966 "A model for estimating the economic effect of water-based recreation projects on local political subdivisions" unpublished PHD Thesis Madison University of Wisconsin.

Kavangh N. "The Economics of Recreational Uses of Rivers and Reservoirs" Water and Water Engineering, 72 1968 401-408

King, David A. 1977. Economic evaluation of alternative uses of rivers. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 60-66. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Reviews the benefit-cost analysis decision criterion and the concept of opportunity cost. Outlines how to measure recreational benefits using the Hotelling-Clauson-Knetsch model. Discusses data and research needs for using benefit-cost analysis as a tool for making river management decisions. Concludes that the ability to use benefit-cost analysis in river management exists and should be exercised.

Kneese, Allen V. The Economics of Regional Water Quality Management. Baltimore, Maryland: Johns Hopkins Press for Resources for the Future, Inc., 1964.

Kneese, Allen V. and Blair T. Bower. Managing Water Quality: Economics, Technology, Institutions. Baltimore: The Johns Hopkins Press, 1968.

Knetsch, J. L. 1965. "Economics of Including Recreation as a Purpose of Eastern Water Projects." Journal of Farm Economics, 46: 1148-1157.

Knetsch, Jack L. Economics of Including Recreation as a Purpose of Water Resource Projects. Washington: Resources for the Future, Inc., January, 1965. (Reprint No. 50).

Knetsch, Jack L. "Recreation in Water Resources Development," In American Water Resources Association Proceedings, 1965. Urbana: American Water Resources Association, 1965, pp. 182-188.

Knetsch, Jack L. 1971. Value comparisons in free-flowing stream development. Nat. Resour. J. 11(4):624-635.

States that current methods of evaluating recreation benefits are incapable of indicating how the demand curve changes with the type of recreation. The role of conventional prices in outdoor recreation is muted because a large portion of the cost is publicly provided. The availability of goods and services is as important for recreation as it is for other goods and services. There are two main considerations for estimating the values of the recreation opportunities that may be provided: (1) number of people it affects, and (2) user's willingness to pay.

Krutilla, John V. and Otto Eckstein. Multiple Purpose River Development: Studies in Applied Economic Analysis. Baltimore: Johns Hopkins Press, 1958.

Krutilla, John V., and Anthony C. Fisher.
1975. The economics of natural environments. 292 p. The Johns Hopkins Press, Inc., Baltimore, Maryland.

Lerner, L. "Quantitative Indices of Recreational Values" in Water Resources and Economic Development of the West. Report No. 11. Proceedings, Conference of Committee on the Economics of Water Resources Development of Western Agricultural Economic Research Council. Reno: University of Nevada, 1962.

Louis Berger, Incorporated. 1971. Methodology to Evaluate Socio-economic Benefits of Urban Water Resources. Prepared for the Office of Water Resources Research, U.S. Department of the Interior. East Orange, New Jersey: Louis Berger, Inc., July 1971.

"Design of Water-Resource Systems - New Techniques for Relating Economic Objectives, Engineering Analysis and Governmental Planning," Arthur Maas et al., Harvard University Press, Fourth Printing, 1970. 23.

Margolis, Julius. "The Economic Evaluation of Federal Water Resource Development." American Economic Review, March 1959, pp. 96-111.

McGahey, P. H. and Harry Erlich. Economic Evaluation of Water, Part I, Search for Criteria. Berkeley, University of California, 1960.

McKinney, R. D. and Paul W. Barkley. Some Economic Impacts of the Water Reservoir Development. Manhattan, Kansas: Kansas State University, 1965.

Michalson, E.L. and Kirkland, L. A Methodology to Develop Evaluation Criteria for Wild and Scenic Rivers. Water Resources Research Institute, University of Idaho. 33 p. 1970.

Report describes a methodology to evaluate the economic, aesthetic and social values related to wild rivers (as designated by the U.S. Wild and Scenic Rivers Act (1968)). First an inventory of the natural and human resources of the study area (Salmon River) was made. The methodology then utilizes this data and involves fourteen subprojects, each concerned with river-related uses. These independent subprojects were then combined to create a series of economic models to determine and compare resource patterns consistent with Wild and Scenic Rivers. The report is a summary of the preliminary findings.

Michaelson, E.L., Socio-Economic Aspects of Wild and Scenic Rivers University of Idaho, Water Resources Institute, for U.S. Dept. of Interior. National Wild and Scenic Rivers System, Public participation, attitudes, carrying capacity, quantification of subjective values, history, related land resources. 1972 Water Resources Institute Washington, D.C.

Michalson, Edgar L., and Joel R. Hamilton. 1975. A methodology for evaluating development-environmental conflicts on wild and scenic rivers. Water Resour. Bull. 11(6):1149-1156.

The Salmon River in Idaho is used as an example in formulating a three-step process for examining environment-development conflicts. The process involves: (1) inventorying resources to determine areas of conflict affecting wild and scenic river status, (2) determining through an evaluation process which resources uses are viable for the river, and (3) comparing various resource uses to determine their economic trade-off values.

Mohony, J. A. 1960. "Economic Evaluation of California's Sport Fishery." California Fish and Game, Vol. 36.

Morris, James A. 1976. Instream flow evaluation for outdoor recreation. In Instream flow needs Spec. Conf. and Symp. Proc., Vol. II, May 3-6, 1976, Boise, Idaho, p. 352-358. Am. Fish. Soc., Bethesda, Maryland.

Recreation is accepted as a legal, competing use for water. Planning guidelines accent the need for ways to evaluate trade-offs among all water uses. A method to subjectively evaluate the effects of different instream flows on river-related recreation activities is proposed. This method should be adaptable to current water resource planning guidelines and be simple to apply.

Nawas, Farid. 1972. The Oregon big game resource: an economic evaluation. Unpubl. Ph.D. thesis p. 88-96, on file at Oregon State Univ., Corvallis, Oregon.

Orlob, G. T., M. B. Sonnen, L. C. Davis, and W. R. Norton. 1970. Wild Rivers - Methods for Evaluation. Prepared by Water Resources Engineers, Inc. for U.S.D.I. Office of Water Resources Research, Project No. C-1477 Washington, D. C. 106 p.

This research project consisted of five tasks undertaken to fulfill the primary objectives of developing and evaluating two methods of analysis that would incorporate intangible values: 1), review of benefit-cost methodology for application to wild rivers and analysis; 2), evaluation of current benefit valuation procedures; 3), develop "benefits foregone subjective decision method", 4), develop quantitative "nonmonetary expression of benefits" method; and 5), a comparative analysis of methods for both fully developed and undeveloped wild river basins.

The methods have been applied to the Sauk River, which is the undeveloped, wild branch of the Skagit River in Washington, and the upper Skagit River, which is the northern branch already dammed in three places for flood control and power production purposes. Each of the two methods has indicated that the current level of development in the Sauk Basin is optimal and should be preserved, the upper arm of the Skagit should be developed even more fully than it already is. (Abstract from Dooling, 1975).

G.T. Orlob,
Water Resources Engineers, Inc.
Development of methods for evaluating wild rivers.
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1972
U.S. Dept. of Interior
Office of Water Resources Research
Washington, D.C.

Osterbind, C. Economic Study of the Proposed Suwannee National River: An Analysis of the Expected Effect of the National River Proposal on the Suwannee Basin Economy. USDI National Park Service Bureau of Economic and Business Research College of Business Administration Uaf florid Gainesville January 1965 38p
Copy location ARC Branch 23 floor

Outdoor Recreation Resources Review Commission. 1962. Water for recreation-values and opportunities. ORRRC Study Rep. 10, 130 p. USDI Geol. Surv., Washington, D.C.

Analyzes future economic demand for water-based recreation in the United States. States that recreationists and industry should compete equally for use of water. Relates factors of water quality and access problems to recreational use of water resources.

Parry, B. Thomas, and Richard B. Norgaard. 1975. Wasting a river. Environmentalist 17(1):17-20, 25-27.

Criticizes the objectivity of the economic assessment made for the New Melones Dam on the Stanislaus River in California. Gives a brief legal history of the dam controversy. Compares and analyzes Army Corps of Engineers benefit cost estimates with authors' own estimates. Notes lack of quantification of adverse environmental impacts in Corps' analysis and concludes Corps' overestimated benefits and underestimated costs of the project.

Pearse, P.H. 'Water-Based Recreation Demands', being pp 134-160 of
Forecasting the Demands for Water (Eds W.R.D. Sewell, B.T. Bower et al),
Department of Energy, Mines and Resources, Ottawa. 1968.

Pelgren, D. E. 1955. "Economic Values of Striped Bass, Salmon,
and Steelhead Sport Fishing in California." California Fish
& Game, Vol. 31.

"Procedures for Evaluation of Water and Related Land Resource
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June 1969. 65.

Regan, M. M. and E. G. Weitzell. "Economic Evaluation of Soil and Water
Conservation Measures and Programs." Journal of Farm Economics,
November 1947, pp. 1275-1294.

Reiling, S. D., K. C. Gibbs and H. H. Stoevener. 1973. Economic
Benefits from an Improvement in Water Quality. Socioeconomic
Environmental Study Series, Environmental Protection Agency.
Washington, D.C.: U.S. Government Printing Office, January 1973.

SEWELL, W.R.D. and ROSTRON, J. (1970) Recreational Fishing Evaluation:
A Pilot Study in Victoria, British Columbia,
Ottawa: Department of Fisheries and Forestry,
pp. 133.

INTERVIEW AND SELF	MULTIPLE REGRESSION	FISHING
COMPLETION SURVEYS	FACTOR ANALYSIS	
OF 103 FISHERMEN	ATTITUDE CHECKLISTS	

Opening chapters review economics-based methods of
evaluating recreation facilities, and the role of perception,
values and attitudes in recreational choice.

From the survey three key dependent variables are used:
investment (in fishing equipment), participation (fishing
days in one year), and personal value (rating of fishing
on a 7-point scale from 'very valuable' to 'not at all valuable').
Factor analysis and multiple regression analysis are used to
explore the relationships between these and other variables.
Background characteristics of the fishermen and other recreation
activities are also described. The prime factor influencing
the decision to go fishing emerges as 'the opportunity to enjoy
the aesthetics of the outdoors': other important factors being
social and 'getting away from it all' (see J.B. Stevens, 1966).

Schott, Robert W. "The impact of Recreational Boating on the Economy of Michigan", Dept. of Park & Recreation Resources Michigan State University 1975

Stern, Carlos David. 1974. Hydropower vs. wilderness waterway: the economics of Project Justification through the sixties. J. Leisure Res. 6(1):46-57.

Presents a critical review of the cooperative study by the U.S. Department of Interior's Bureau of Reclamation and National Park Service and the Army Corps of Engineers in the early 1960's. The study analyzes alternatives for developing the last major natural stretch of the upper Missouri River, scrutinizes recreation benefits at reservoirs and on wilderness waterways, and suggests willingness to pay and opportunity costs as two approaches to better measure such benefits.

Stern, C. D. 1974. Hydropower vs. Wilderness Waterways: The Economics of Project Justification through the Sixties, Journal of Leisure Research, 6:46-57, Winter.

Several bureaus in the Dept. of Interior and Army Corps of Engineers undertook a joint study in the 1960's to analyze a set of alternatives for developing one of the last major natural stretches of the Missouri River characterized by outstanding scenic beauty and historic value. This article takes issue with the study's methods of presenting these alternatives and its calculations of recreation benefits at reservoirs and on the waterway. Also discussed were willingness-to-pay and opportunity cost approaches as alternative measures. This is a very timely article and well presented.

Stevens, T. H. and R. J. Kalter. 1970. "Technological Externalities, Outdoor Recreation, and the Regional Economic Impact of Cayuga Lake." A. E. Res. 317. Ithaca, New York: Cornell University Department of Economics, May 1970.

Street, Donald R. 1965. "An Economic Analysis of Regulated Fee Fishing Lakes in Pennsylvania." Unpublished Ph.D. Dissertation. Pennsylvania State University.

Street, Donald R. 1967. "Recreation Economics--Fee Fishing in Pennsylvania." Pennsylvania State University, Department of Agricultural Economics and Rural Sociology. Bulletin No. 62.

Seckler, David W. 1966. "On the Uses and Abuses of Economic Science in Evaluating Public Outdoor Recreation." Land Economics, 42: 485-494.

Shaffer, Ron E., and Stephen F. McCool. 1973. Who's tubing down the Apple? Techn. Rep. 4, 31 p. Univ. Wisconsin, River Falls, Wisconsin.

Reports on the socio-economic characteristics of persons using innertubes to float the Apple River in west-central Wisconsin during 1971-1972. In 1971 social profiles and user attitudes were identified; in 1972 the economic impact of floaters on the local community was examined. Discusses interest of weekend and weekday users for more lodging and eating facilities in the immediate area. But found floaters contributed little revenue to the local economy.

Smith, R. J. 1968. "The Measurement of Economic Benefits of Recreation: A Critical Survey of Literature and of the Development of the Theory." Faculty of Commerce Discussion Paper, Series A #101. Alabama: University of Birmingham, October 1968.

Stroup, R. L., M. D. Copeland, and R. R. Rucker. 1976. Estimation of amenity values as opportunity costs for energy-related water use in Montana. Montana Univ. Joint Water Resour. Res. Cent. Rep. 81, 51 p. Dep. Agric. Econ., Montana State Univ., Bozeman, Montana.

It is increasingly important that the value of water resources for nonconsumptive uses, such as recreation, be quantified. Numerous methods of site evaluation have been attempted but all have encountered problems stemming from the use of proxies for consumers willingness to pay for site use. A fee experiment for a specific site on the Yellowstone River is specified in detail. This method avoids the problems associated with proxies for consumer willingness to pay.

Stoevener, H. H. and A. A. Sokoloski. "Estimation of the Magnitude and Distribution of Benefits from Recreational Resource Management in the Economy of a Small Area." Agricultural Experiment Station. Corvallis, Oregon: Oregon State University.

Tennessee Valley Authority. Benefit-Cost Analysis for Water Resource Projects: A Selected Annotated Bibliography. Knoxville, Tennessee: Tennessee Valley Authority, 1967.

Towell, W.E. "How much is a Wild River Worth?" in American Forests 74(2) Conservation, Ozark National Scenic Riverway, Wild Rivers, Aesthetic Values February 1978

Scenic Rivers Study Unit. 1970. A Methodology for Evaluation of Wild and Scenic Rivers. University of Idaho, Water Resources Institute, September 1970.

Wennergren, E. B. 1964. "Valuing Non-Market Price Recreation Resources." Land Economics, 40: 303-314.

Wennergren, E. B. 1966. "Recreation Resources Values: Some Empirical Estimates." Water Resources and Economic Development of the West. Report No. 13. Washington, D.C.: Committee on the Economics of Water Resources Development of the Western Agricultural Economic Research Council. Pullman, 1966.

2. MANAGEMENT TECHNIQUES

A. RESOURCE CONSERVATION

Aitchison, Stewart W., Steven W. Carothers, and R. Roy Johnson. 1977. Some ecological considerations associated with river recreation management. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 222-225. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Drawing from an ecological study on the Colorado River, four river recreation management concerns are discussed: (1) river research versus river management--their interrelations and priorities, (2) extensive resource inventories--their role as indicators of environmental deterioration, (3) human impact--its identification and proposed mitigation, and (4) suggested guidelines for identifying unique and ecologically sensitive areas. Also discussed are other environmental degradents not directly associated with human impact, but nevertheless a source of concern for river managers, such as habitat destruction by wild burros.

Alberta Wilderness Association. "Planning for the Protection of our Rivers". Newsletter. Vol. 11, No. 2. Spring. Supplement. Available from Alberta Wilderness Association, Box 6398, Station "D", Calgary, Alberta. T2P 2E1.

This special supplement provides a perspective to the protection of Alberta Rivers and outlines in some detail the protection measures for rivers of natural, historical and recreational value in Canada and the United States. A list of very recent references on river corridors - their resources and management - is also provided.

Alexander, Harold E. "Problems and Progress in Stream Preservation." Reprinted from Transactions of the Thirtieth North American Wildlife and Natural Resources Conference. March 8-10, 1965. Washington, D.C.: Wildlife Management Institute, 1965, pp. 76-88.

AUKERMAN, ROBERT.
1971. WATER QUALITY CRITERIA FOR SELECTED RECREATIONAL USES-SITE COMPARISONS.
PH.D. DISS. UNIV. ILLINOIS AT URBANA, CHAMPAIGN, ILLINOIS.
338 P.

COMPARES RECREATION USERS AT NINE SITES ON THEIR ATTITUDES, BELIEFS, AND BEHAVIOR CONCERNING WATER QUALITY CHARACTERISTICS. IDENTIFIES WATER QUALITY COMPONENTS WHICH AFFECT RECREATION USER PERCEPTION. UNDERTAKES TO DEVELOP AESTHETIC WATER QUALITY CRITERIA FOR RECREATION USES, WHICH COULD BE USED TO ENHANCE THE QUALITY OF THE RECREATION EXPERIENCE.

AUKERMAN, ROBERT, SPRINGER, WILLIAM.
1976. EFFECTS OF RECREATION ON WATER QUALITY IN WILDLANDS.
EISENHOWER CONSORTIUM BULLETIN 2, 25 P. DEP. RECREATION
RESOUR., COLL. FOR. AND NAT. RESOUR., COLORADO STATE UNIV.,
FORT COLLINS, COLORADO.

PRESENTS THE RESULTS OF A STUDY TO EVALUATE THE WATER
QUALITY IMPACT OF RECREATIONAL USE ON A SAMPLE OF
CAMPGROUNDS ON THE CACHE LA POUDE RIVER IN COLORADO.
FINDINGS INDICATE THAT RECREATIONAL USE WAS NOT A
SIGNIFICANT CAUSE OF BACTERIAL WATER POLLUTION. FOR THE
INSIGNIFICANT WATER POLLUTION THAT DID OCCUR, ALMOST AN
INVERSE RELATIONSHIP WAS FOUND BETWEEN CASES OF BACTERIAL
DENSITY INCREASES AND LEVELS OF CAMPGROUND UTILIZATION.
SIGNIFICANTLY MORE CASES OF BACTERIAL POLLUTION WERE FOUND
WITH MOTORIZED CAMPERS THAN WITH BACKPACK CAMPERS. BACTERIAL
INCREASES OBSERVED AT FOOTPATH CAMPGROUNDS WERE MUCH LESS
THAN OBSERVED AT CAMPGROUNDS ACCESSIBLE BY A ROAD SYSTEM.

Beamish, Richard. "Protecting our Natural Rivers"
The Conservationist. Feb.- March 1975. 10 pp.
Copy location ARC library

Blood (Donald A.) and Associates, Ecological Consultants. The functional
Approach to Resource Conservation In Canadian National Parks. Keynote
Adress delivered at Conference of Resource Conservation Section, Parks
Canada, Ottawa, February 26, 1979

Brookbanks, Eric, & Simms, Robert. "Landscape Planning of the
River Tees Corridor." The Planner, Vol. 60, No. 10, Dec.
1974, pp. 943-947.

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Conservation.

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survey of the Colorado River and its
tributaries between Lee's Ferry and the
Grand Wash Cliffs, Phase 1. North.
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rep., 172 p. Natl. Park Serv., Grand
Canyon Natl. Park, Flagstaff, Arizona.

CAROTHERS, S. W., AITCHISON, S. W., KARPISCAK, M. M.,
RUFFNER, G. A., SHARBER, N. J.
1976. AN ECOLOGICAL SURVEY OF THE RIPARIAN ZONE OF THE
COLORADO RIVER BETWEEN LEES FERRY AND THE GRAND WASH CLIFFS,
ARIZONA.
USDI NAT. PARK SERV., COLORADO RIVER RES. SERIES TECH. REP.
10, 251 P. GRAND CANYON NAT. PARK, GRAND CANYON, ARIZONA.

REPORTS THE RESULTS OF A 2 YEAR ECOLOGICAL STUDY OF THE
RIPARIAN ZONE OF THE COLORADO RIVER BETWEEN LEES FERRY AND
GRAND WASH CLIFFS, ARIZONA. AMONG THE TOPICS STUDIED WERE
VEGETATION CHANGES RESULTING FROM CONTROLLED WATER RELEASE
FROM GLEN CANYON DAM AND INTERRELATIONSHIPS OF HUMANS WITH
THE BIOTA. FINDS THAT HUMAN IMPACT APPEARS TO BE A FUNCTION
OF VISITOR ACTIVITIES AND RECOMMENDS MEASURES TO REDUCE
HUMAN IMPACTS.

Chorley, R. J. 1969. The drainage basin
as the fundamental geomorphic unit.
In Water, earth, and man. p. 77-99.
R. J. Chorley, ed. Methuen and Co.
Ltd., London.

Doyle (Robert E.) "Rivers Wild and Pure: A Priceless
Legacy" National Geographic Magazine Vol. 152 #1
1977 July p.2-59 copy location ARC library -

Frissell, Sidney S. 1972. Environmental planning along Montana's
Blue-Ribbon trout streams. Montana Water Resources
Research Center, Proj. No. A-047-MONT, 19 p.

Abstract: A stream classification system adopted in 1959 identified
seven Montana waterways as "Class 1 - streams of
national as well as state-wide significance." *This study
describes the current ownership and land-use patterns
along six of these streams. Between 45 and 85 percent
of the stream banks are in private ownership. Current
land uses are predominately ranching and forested
lands. Several situations are identified which could
threaten the environmental corridors of the Blue-ribbon
streams. An investigation of stream user attitudes
indicates that a majority are attracted by the natural

Gilchrist, Martin C. 1971. Strategies for preserving scenic rivers: the Maryland experience. *Landscape Archit.* 62(1):35-42.

Describes procedures to evaluate Maryland rivers for potential scenic river protection. Criteria for protection include physical, biological, and human conditions along a river and its corridor.

Gillham, Mary. "Canal Corridors for Wildlife." Everyman's Nature Reserve, ed. Eve Dennis, Newton Abbot, David & Charles, 1972, pp. 167-173.

Hanson, W. R. n. d. Conserving a Watershed. Eastern Rockies Forest Conservation Board (Alberta).

Hartzog, George B., Jr. Let's Save the Buffalo River. *Parks & Recreation*, v.4, August 1969: 12-15, 49-50.

HEINSELMAN, MIRON L.

1969 Diary of the Canoe Country's landscape. Naturalist
20(1): 2-13.

Outlines the ecological and human history of the Quetico-Superior Canoe area to explain the reasons for the area's diversity in a manner suited to a canoe traveller's understanding. Provides a source of education for the visitor on the role that fire has played in the natural history of the area, thus forming a basis of communication for future management policy which might include techniques of prescribed burning.

HENDEE, JOHN C., AND DALE R. POTTER

1971 Human behavior and wildlife management: needed research. P. 383-396, in: Trans. 36th N. Amer. Wildlife and Nat. Res. Conf., March, 1971. Wash., D.C.: Wildlife Management Inst., Wire Building.

Identifies several broad problem areas and specific questions to which research on human behavior aspects of wildlife should be directed: (1) hunting satisfaction; (2) non-consumptive use of wildlife; (3) the hunter population; (4) access and hunter opportunity; (5) wildlife economics; and (6) political legal issues. States that rigorous social-wildlife research is scarce yet necessary for successful and meaningful wildlife management. Nearly 70 literature citations are included. (Also see, by Dale R. Potter, Kathryn M. Sharpe, and John C. Hendee, "Human behavior aspects of fish and wildlife conservation - an annotated bibliography". 288p. Pac. Northwest For. Exp. Sta., Portland, Ore. USDA For. Serv. Gen. Tech. Rep. PNW-4, 1973).

Hendee, John C., and George H. Stankey.
1973. Biocentricity in wilderness
management. Bioscience 23(9):535-538.

Hendrickson, G. E., and C. J. Doonan. 1972. Hydrology and recreation on the cold-water rivers of Michigan's southern peninsula. Geol. Surv. Water Inf. Rep. 3, 83 p. Lansing, Michigan.

Recreational values (e.g., trout fishing, boating, camping) of rivers are dependent on streamflow characteristics, water quality, and character of channel, bed, and banks. Generally, recreational value is enhanced by a relatively uniform streamflow. Suggests techniques such as preserving streamside vegetation to maintain water temperatures, controlling disposal of heated water to streams, and maintaining stream flow during drought periods, to manage streams for recreational values.

Herrington, Rosco B., and Donald K. Dunham. 1967. A technique for sampling general fish habitat characteristics of streams. Intermountain For. and Range Exp. Sta., Ogden, Utah, U.S.D.A. For. Serv. Res. Pap. INT-41. 12 p.

Abstract: This paper describes a sampling technique for taking measurements along selected transects across streams. When tested on three streams in Utah, the results provided acceptably precise estimates of stream length and width, surface area, pool area, riffly area, depth, and stream bed composition, as well as of the stability and vegetative cover of the stream banks. Such data will permit land managers and fisheries biologists to evaluate the fishery potential of selected streams and to diagnose basic deficiencies in fish habitat.

Keywords: Water Evaluation, Angling, Stream Measurement, Utah.

Herrick, Ramona. Wilderness Preservation in North America: A prospectus and annotated bibliography. Department of Indian and Northern Affairs, Parks Canada. May, 1974. 255 p. Copy location: ARC library.

Hill, G. A. 1961. The Ecological Basis for Land Use Planning (Research Report No. 46). Ontario Department of Lands and Forests.

HUDSON, MICHAEL.

1977. FORTY MILE RIVER: BIOLOGICAL ASPECTS OF CARRYING CAPACITY.

52 P. USDI BUR. LAND MANAGE. FORTY MILE RESOURCE AREA, TOK, ALASKA.

PRESENTS THE RESULTS OF A TRAMPLING EXPERIMENT CONDUCTED ON THE FORTY MILE RIVER IN ALASKA TO DETERMINE BIOLOGICAL ASPECTS OF THE RIVER'S RECREATION CARRYING CAPACITY. ON EACH OF 4 SELECTED STUDY PLOTS, 3 TRANSECTS WERE TRAMPLED A TOTAL OF 50, 250 AND 1000 TIMES DURING 10 VISITS. RECORDED EFFECTS OF TRAMPLING ON PLANT SPECIES DURING THE FIELD WORK, AND NOTED TOTAL EFFECTS OF THE TRAMPLING UPON PLANT COMMUNITIES AS WELL AS THE PATH WIDTH AND DEPTH AT THE TERMINATION OF FIELD WORK.

Jackle, John A. Past Landscapes: A bibliography for Historic Preservationists Selected from Literature of Historic Geography. September, 1974. Council of Planning Librarians. Exchange library #651. 56 p.

James, George A. 1974. Physical site management. *In* Outdoor recreation research: applying the results. Papers from a workshop held by the USDA Forest Service at Marquette, Michigan, June 19-21, 1973. p. 67-82. USDA For. Serv. Gen. Tech. Rep. NC-9, 113 p. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Notes that much information is available about the protection and maintenance of recreation sites, but the large number of resource variables and the highly specific nature of many research findings make it difficult to condense this information into a compendium of site management guidelines. Maximum use is apparently not being made of available site management information. Reasons include the highly scattered nature of information, difficulty in obtaining pertinent material, and research findings not always directly applicable to the problem at hand. A suggested reading list with 60 annotated articles on the subject is presented.

"Wetlands Preservation," Peter L. Johnson, Open Space Institute, 1969. 40.

KELSALL, JOHN P., ERNIE KUNT, AND STEVEN C. ZOLTAI

1971 Ecology of the Fort Reliance - Artillery Lake area -
a report compiled to provide information requested
for the planning of a new national park. 99p. Can.
Wildl. Serv. for DIAND Natl. Hist. Parks Br., Ottawa.

Main attraction of the area for a national park would
be hiking, canoeing, together with fishing and the simple appreciation
of scenery and other aesthetic values, therefore, recommends develop-
ment of canoe routes, hiking and cross-country ski trails. Mentions
campsites and their effect on the fragile environment.

Kuska, James J. 1977. Biological approach to river planning and management. In
River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech.
Rep. NC-28, p. 296-303. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The intent of Wild River legislation was to protect certain rivers for the benefit and
enjoyment of present and future generations. Suggests that to accomplish this goal,
river developers and managers must consider: (1) a riverway's ordered nature and inherent
limitations; (2) which specific environments (soils, vegetation) and related variables
(aspect, slope) along the river are best able to absorb recreational use; and (3) how
much modification (vegetation and soil degradation) of a particular environment to accept
before use is altered or limited.

"Proceedings of the Marsh and Estuary Management Symposium,"
Louisiana State University, July 1967. 23.

Mager, Russ. Wilderness and the Living Middle Snake. Living
Wilderness, v.33, Autumn 1969: 8-11.

A discussion of the Hells Canyon and Middle Snake areas,
whose future will be determined by Congress. Three possible
alternatives are: the construction of one or more dams
immediately, the so-called "Moratorium Bill," the
establishment of the Hells Canyon-Snake National River.

MANNING, ROBERT E.

1979. IMPACTS OF RECREATION ON RIPARIAN SOILS AND VEGETATION.
WATER RESOUR. BULL. 15(1):30-43.

REVIEWS AND SYNTHESIZES THE LITERATURE DEALING WITH THE
PHYSICAL IMPACTS OF RECREATION USE ON RIPARIAN SOILS AND
VEGETATION. DISCUSSES PRINCIPAL MODES OF IMPACTS, SPATIAL AND
TEMPORAL PATTERNS OF IMPACT, AND STRATEGIES FOR MEASURING
IMPACT. THROUGHOUT THE PAPER, MANAGEMENT IMPLICATIONS OF
RESEARCH FINDINGS ARE CONSIDERED.

MCKEE, P. L.

BRICKLER, S. K.

1977. BOTTOM SEDIMENT ANALYSES OF THE RECREATIONAL WATERS OF
UPPER SABINO CREEK.

IN HYDROLOGY AND WATER RESOURCES IN ARIZONA AND THE
SOUTHWEST. VOL. 7. P. 109-114. SCHOOL OF RENEWABLE NATURAL
RESOURCES, UNIVERSITY OF ARIZONA, TUSCON, ARIZONA.

PRESENTS THE RESULTS OF AN ANALYSIS OF THE BOTTOM SEDIMENTS
OF UPPER SABINO CREEK IN ARIZONA WHICH HAS SERIOUS WATER
QUALITY PROBLEMS CREATED BY RECREATIONAL DEMANDS. FINDS
THAT BOTTOM SEDIMENT FECAL COLIFORM BACTERIA ANALYSES
INDICATE THAT THE CREEK IS MORE HAZARDOUS TO RECREATION
USERS THAN IS INDICATED BY SURFACE WATER BACTERIA ANALYSES
ALONE. CONCLUDES THAT BOTTOM SEDIMENT BACTERIA ENUMERATION
IS IMPORTANT TO INCLUDE IN ALL RECREATION WATER QUALITY
ANALYSES.

Mills, Harlow B., Man's Effect on Wildlife of the Illinois River,
Urbana Dept. of Registration and Education Natural History Division
1966. Ministerial Library 14th Floor Sh.222. 144 MS4

"The Watershed as a Resource Management Unit: A Selected
Bibliography," Bruce Mitchell, Department of Geography,
University of Waterloo. Joan Mitchell, Technical Services,
Waterloo Lutheran University, May 1972. 68.

More, Thomas A., Robert O. Brush, and J. Alan Wagar. 1977. Variation and recreation quality in river management. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 329-333. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Suggests that variability in the river environment is a major determinant of the quality of river recreation experiences. Four main sources of variation exist for river canoeing: psycho-social, landscape, river, and the activity itself. By considering how these sources of variation interact, suggests that it should be possible to affect the quality of the recreation experience and accomplish other management objectives as well.

Norbeck, C. S. 1972. "Planning Study for a National Nature Preserve Along the South Saskatchewan River, Suffield Area, Alberta." M. A. thesis, University of Calgary.

Contains a proposal for a "National Nature Preserve" along a one mile wild strip of land of the South Saskatchewan River in the Suffield Area of Alberta. Develops recommendations pertaining to recreational use on the river and along adjacent shoreland areas. No rigorous inventory or evaluation procedure was applied.

OHMANN, LEWIS F., AND ROBERT R. REAM

1971 Wilderness ecology: virgin plant communities of the Boundary Waters Canoe Area. North Central For. Exp. Sta., St. Paul, Minn. USDA For. Serv. Res. Pap. NC-63, 55p., illus.

Describes virgin (natural) plant communities of the Interior Zone of the BWCA where wilderness goals and ecological techniques are applicable. Data from all vegetative components of 106 virgin upland stands were used to construct a community classification through a combination of agglomerative clustering and principal components analysis. Discusses the relation of communities to their environment and to past wildfires. Contains a list of forty references pertaining to vegetation classification and principles of ecology. (Also see, by same authors, "Wilderness ecology: a method of sampling and summarizing data for plant community classification." N. Cent. For. Exp. Sta., St. Paul, Minn. USDA For. Serv. Res. Pap. NC-49, 14p., illus., 1970).

Parker, J.

"Historic Resource Planning of the Lower Rio Grande Valley State Planning Region--21"
Dept. of Park Administration, Landscape Architecture and Horticulture, Texas Tech University 1975.

PARTLOW, JIM (School of Landscape Architecture, Univ. of Guelph)
1971 Aesthetic inventory of Lake Superior Provincial Park.
for Ont. Dep. Lands Forests (White River District).

The study was a land inventory to define the unique areas in Lake Superior Provincial Park and to explain why these areas are significant. Reviewed three aspects of the park: aesthetic quality, botanical communities, geomorphology and geology. Identified the best waterfalls and lookouts. Management plans and proposals related to trails, a scenic road, recreational activities (hiking, canoeing, viewing, fishing), and logging.

Pfister, Robert E. "Reflections upon Protecting Free Flowing Rivers in North America". Paper prepared for presentation with slides at the annual meeting of Outdoor Recreation Council of B.C. at Capilano College, North Vancouver. October 28, 1977. 10 p. Copy location: ARC library.

Prakash, C. Sharma. Planning for Wildlife Conservation. A selected bibliography, Council of Planning Librarians #1300. 15 p. June, 1977. Monticello, Illinois. Copy location: Ministerial library, 14th Floor.

REED, N. P.
1977. AN OFFER TOO GOOD TO REFUSE.
PARKS AND RECREATION 12(2): 15A-17A.

FOCUSES ON THE BENEFITS THAT CAN BE OBTAINED FROM IMPLEMENTATION OF THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972. DISCUSSES AND GIVES EXAMPLES OF HOW THE BUREAU OF OUTDOOR RECREATION, THE FISH AND WILDLIFE SERVICE AND THE NATIONAL PARK SERVICE CAN USE SPECIFIC PROVISIONS TO PROTECT NATURAL RESOURCES, ENCOURAGE RECREATION PROGRAMS AND BENEFIT FISH AND WILDLIFE. EXAMINES THE PROGRAMS BEING PURSUED BY THESE 3 DEPARTMENTS UNDER THE ACT.

Rich, S. Additional Comments on Watershed Administration
Ottawa, 1970. 17p.
Documentation Center, 25th floor
HE0453.C2R37

Satterlund, Donald R. Wildland Watershed Management. New York
Ronald Press, 1972, 370p.

SCHMIDLY, DAVID J. DITTON, ROBERT B.
1973. RELATING HUMAN ACTIVITIES AND BIOLOGICAL RESOURCES
IN RIPARIAN HABITATS OF WESTERN TEXAS.
IN STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN
WETLANDS AND OTHER RIPARIAN ECOSYSTEMS SYMP. PROC. USDA FOR.
SERV. GEN. TECH. REP. WO-12, P. 107-116. WASHINGTON D.C.

DISCUSSES THE RECREATIONAL AND WILDLIFE VALUES OF RIPARIAN
HABITATS ALONG THE RIO GRANDE RIVER IN WESTERN TEXAS.
EVALUATES SEVERAL HUMAN ACTIVITIES THAT HAVE THE POTENTIAL
TO OR HAVE IMPACTED ON RIPARIAN RESOURCES IN THE REGION
INCLUDING: 1) IRRIGATION DIVERSIONS AND STREAM
CHANNELIZATION, 2) LAND FLOODING FROM RESEVOIR CONSTRUCTION,
3) LAND CLEARING, 4) OVERGRAZING, 5) INTRODUCTION OF EXOTIC
PLANTS AND FISHES, 6) INCREASES IN HUMAN RECREATION ACTIVITY
AND 7) PESTICIDE BUILDUPS.

SCOTTER, GEORGE W., N.M. SIMMONS, H.L. SIMMONS, AND S.C. ZOLTAI
1971 Ecology of the South Nahanni and Flat River Areas. Can.
Wildlife Serv., unpubl. rep. ix + 186p., 5 maps.

In this study's discussion of the Nahanni National
Park proposal (p. 145-170), the authors endorse the suggestion that
the new park be given a "wild rivers wilderness theme" and that "the
traditional forms of park developments" be avoided. They emphasize the
incompatibility of roads and automobiles in this theme. "The use of
canoes, kayaks, rafts, and other unpowered river craft should be
encouraged." Various facility proposals include: (1) "minor camp-
sites consisting only of well-hidden fireplaces, tent clearings, and
trash barrels"; (2) possibly "mountaining cabins"; (3) "backpacking
should be encouraged by establishing hiking trails from the rivers
to ... points of interest"; and (4) "interpretive displays." The
authors also recommend that "no fire control be practiced within the
potential National Park site."

Simmons, I. "Protection and development
in the National Parks of England and Wales: the
role of the physical Environment" Geographia
Polonica Warszawa 1976 no. 34 p. 279-290
1 tab, 1 carte, bibl (4 ref)
Geomorphologie appliquée et evaluation de
l'utilisation du sol. Identification des
influences directes et indirectes de l'espace
naturelle sur la planification. L'aménagement pour
les loisirs pleinair et les parcs naturels en
Angletere et au Pays de Galles
résumé tiré de International Geographical bibliography 1977 vol.82

Slass, George J. Water Related Environmental Planning.
#365. Council of Planning Librarians. Monticello,
Illinois. February, 1973. 15 p. \$1.50 Copy
location: Ministerial library 14th Floor.

Stankey (H. George) "A Strategy for the Definition and Management of
Wildlife Quality" in Natural Environments Studies
in Theoretical Applied Analysis edited by John V.
Krutilla published for Resources for the Future
The John Hopkins University Press 1972, Chapter 3
Baltimore.

Stalnaker, C. B., and J. L. Arnette (ed.). 1976. Methodologies for the determination of stream resource flow requirements: an assessment. 199 p. USDI Fish and Wildl. Serv., Off. Biol. Serv., Lakewood, Colorado.

Examines techniques and methods used to assess instream flow requirements for fish and other aquatic life, wildlife, recreation activities, and aesthetic values. Discusses the measurement of recreation activities and the assessment of those social attitudes that affect demand or potential demand for stream-associated recreation resources. Analyzes the aesthetics of flowing streams and adjacent landscapes. Measuring aesthetics is discussed with emphasis upon viewer evaluation and environmental qualities.

Sumner, David. 1975. Will the Dolores live up to its name? Sierra Club Bull. 60(7):4-5.

Chronicles the gradual deterioration of the Dolores River in southwestern Colorado. Notes diversity of ecological realms along the river and describes a river trip from Cahone and Bedrock to the Colorado River in Utah. Urges preservation of the river in the National Wild and Scenic Rivers System.

Sumner, David. 1976. Wild rivers, flowing free. Nat. Wildl. 14(4):20-27.

Documents the problems involved in preserving six of the rivers that are either included in the National Wild and Scenic Rivers System or are being studied to be included. Discusses controversial issues and problems involved in preserving the areas yet managing them for various types of activities.

Tarlock, Dan A. 1967. Preservation of scenic rivers. Kentucky Law J. 55(4):745-798.

Suggests that preserving free-flowing water is a public value that should be considered in water resources planning decisions. Offers methods of incorporating these values into the decision-making process. States that at present, preservation is a value secondary to development and that existing laws favor short term uses of water (power generation, flood control, and irrigation) over long term uses. Maintains that technology will continue to increase leisure time and that preserving some of the remaining unharnessed stretches of rivers will help sustain important recreational opportunities.

Tennant, Donald L. 1976. Instream flow regimens for fish, wildlife, recreation and related environmental resources. In Instream flow needs Symp. Proc. and Spec. Conf. Vol. II, May 3-6, 1976, Boise, Idaho, p. 359-373. Am. Fish. Soc., Bethesda, Maryland.

Describes a quick, easy method for determining flows to protect the aquatic resources in both warmwater and coldwater streams based on their average flow. Detailed field studies were conducted on 11 streams in 3 States between 1964 and 1974. This work involved physical, chemical, and biological analyses of 38 different flows at 58 cross-sections on 196 stream-miles, affecting both coldwater and warmwater fisheries. The studies reveal that the condition of the aquatic habitat is remarkably similar on most of the streams carrying the same portion of the average flow.

Terry, Claude E. 1976. Preserving an urban river: the Chattahoochee. Environmental Comment, June 1976. (A publication of the Urban Land Institute) p. 9-11.

Briefly describes the scenic and recreational attributes of the Chattahoochee River in the Atlanta metropolitan area. Discusses the combined efforts of local citizens and officials, State agencies, and Federal bureaus in acquiring land to preserve the Chattahoochee and its corridor.

U.S. DEPARTMENT OF INTERIOR, FEDERAL WATER POLLUTION CONTROL
ADMINISTRATION.

1968. WATER QUALITY CRITERIA.

234 P. NAT. TECH. ADVISORY COMM. REP., FED. WATER POLLUTION
CONTROL ADMIN., WASHINGTON, D.C.

A COMPREHENSIVE DOCUMENT ON WATER QUALITY REQUIREMENTS FOR
USE IN WATER QUALITY STUDIES AND STANDARDS SETTING
ACTIVITIES. A SUBDIVISION PROVIDES RECOMMENDED WATER
QUALITY CRITERIA FOR RECREATIONAL USE AND AESTHETIC PURPOSES
FOR RIVER PRESERVATION PROGRAMS.

*Typical Landscape Characteris-
tics and Associated Soil and
Water Management Problems on
the Mt. Baker National Forest;
Pacific Northwest Region, Forest
Service; 1966.*

U.S.D.A. Forest Service. National Forest Landscape Management
Volume 1. Agriculture Handbook Number 434. Washington,
D.C.: U.S. Government Printing Office, February 1973.

National Forest Landscape Management Volume 2 -
Chapter 1: The Visual Management System. Agriculture
Handbook Number 462. Washington, D.C.: U.S. Government
Printing Office, April 1974.

National Park Service and New England River Basins Commission.
Shoreline Appearance and Design: A Planning Handbook.
Prepared by Roy Mann Assoc., Inc. April 1975.

U.S. Senate Select Committee on National Water Resources. 1960. Water resources
activities in the United States; water recreation needs in the United States, 1960-2000.
Comm. Print 17, 86th Congr. 2d. Sess. Gov. Print. Off., Washington, D.C.

Covers such topics as the rapidly increasing use of water-based areas, problems of intensive
use and crowding, planning for additional areas, public water supply legislation, and inade-
quate criteria for estimating future water-based recreation needs. Contains 17 recommenda-
tions by the National Park Service regarding Federal objectives for water-related recreation
areas. An Appendix contains recommendations for general policy by the Committee.

"Water Resource Planning," National Water Commission, June 1972.
NTIS, NWC-EES-72-057. \$6.75. 35.

Virginia Commission of Outdoor Recreation. Virginia's
Scenic Rivers. 803 E. Broad Street, Richmond,
Va. River Inventory, Scenic Rivers System,
Recommendation, Resource Protection. 1969.
(Plus Supplement to 1975).

Water Resources Council. 1973. Water and
Related Land Resources. Establishment
of Principles and Standards for Planning.
Federal Reg. 38(174):37-55.

"Techniques for Wetland Management," Linde, Wisconsin Department
of Natural Resources, 1969. 67.

B. INTERPRETATION PROGRAMS AND FACILITIES

Alderson, W. I., and S. P. Low. 1976.
Interpretation of historic sites. 189 p.
Am. Assoc. State & Local Hist.,
Nashville, Tennessee.

Cherem, Gabriel J., and David E. Trawcek. 1977. Visitor employed photography: a tool for interpretive planning on river environments. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 236-244. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The methodology of visitor employed photography (VEP) is explained as a device to inventory public perception of natural environments. A VEP study on the Huron River in Michigan is summarized and the use of VEP findings in the development of interpretive services and programs for river environments is discussed.

Cherem, Gabriel J. 1975. The environmental interpreter: new frontiers. Assoc. Interpretive Naturalists Proc. 16 p. Derwood, Maryland.

Field, Donald R., and J. Alan Wagar.
1973. Visitor groups and interpretation in parks and other outdoor leisure settings. J. Environ. Educ. 5(1): 12-13.

Harrison, Anne. 1977. Getting your story across--interpreting the river resource. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 125-138. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Suggests interpretation has special needs as it relates to river systems. These are discussed in light of the opportunities and problems associated with different sites, audiences, messages, and media. The appropriateness of media to river classifications is emphasized. Examples of interpretive services are used to illustrate the principle points of the discussion.

ONTARIO DEPARTMENT OF LANDS AND FORESTS

1971 Quetico Provincial Park - an interpretive programme concept. (prepared for presentation to the Quetico Advisory Committee). Ont. Dep. Lands For., Parks and Rec. Areas Br., Toronto.

Prepared to give the Quetico Advisory Committee some insight into what interpretation is, what must be considered in Quetico's interpretation and what specific possibilities are for interpretation assuming certain roles for Quetico and its area. Includes interpretive themes for Quetico: wilderness, history and prehistory, geology, biology, and ecology. Discusses numbers and types of visitors to Quetico, the possible information about Quetico and interpretive media to different types of visitors.

Putney, Allen D., and J. Alan Wagar. 1973.
Objectives and evaluation in interpretive planning. J. Environ. Educ.
5(1):43-44.

Sharpe, Grant, ed. 1976. Interpreting the environment. 566 p. John Wiley & Sons, Inc., New York.

SHOMAN, JOSEPH J. (ed.)

1968 Manual of outdoor interpretation. 104p. N.Y.:
Natl. Audubon Soc., (Nature Centers Div.) 1130
5th Ave., New York, N.Y. 10028.

This guidebook covers the broad field of modern outdoor interpretation ranging from the philosophy and need for outdoor interpretation and education to such practical aspects as how and to what extent interpretive programs should be carried out on sensitive natural areas. Fourteen well-qualified authors cover various aspects of outdoor interpretation and show what is being done in many types of areas where outdoor interpretation and learning are being stressed. Includes: "Needed: nature appreciation and an outdoor conscience", Paul Brooks; "Meaning and general principles of outdoor interpretation", W. H. Carr; "Natural areas", C. H. W. Foster; and others.

STIRRETT, GEORGE M.

1963

The role of natural history interpretation in the management of parks. 23p. (mimeo.) a paper read at the Technical Meetings, Second Fed.-Prov. Parks Conf., Ottawa.

"This paper is intended as a general introduction to the role of natural history and the professional park naturalist in the park or parks organization." Includes definitions and values of interpretation and interchanges the term with natural "history program" and "naturalists' program". States that some benefits derived from a naturalists' program include: "lowered vandalism, better outdoor manners, reduced costs of maintenance, inculcates pride in Canadians in their parks, prestige value, teaches love of nature, adds meaning to life, places proper value upon nature and parks." The paper goes on to review the role of interpretation in the U.S. Reviews several studies and authors' views on the role of interpretation and outdoor recreation. After emphasizing the importance and multi-dimensional nature of interpretation, Stirrett outlines the necessary abilities and training of a naturalist. Concludes with the importance of the naturalist and interpretation to the proper planning and management of national parks. This paper concludes with several references combined with a selected annotated bibliography.

Tilden, Freeman. 1967. Interpreting our heritage. 120 p., illus. Univ. North Carolina Press, Chapel Hill, North Carolina.

TRAWEK, DAVID E.

1977. VISITOR EMPLOYED PHOTOGRAPHY ON THE HURON RIVER: A TOOL FOR INTERPRETIVE PLANNING.

PH.D. DISS. OHIO STATE UNIVERSITY, COLUMBUS, OHIO. 210 P.

EXAMINES VISITOR EMPLOYED PHOTOGRAPHY (VEP) AS A METHODOLOGY TO EVALUATE BOTH THE POSITIVE AND NEGATIVE ASPECTS OF CANOEISTS' PERCEPTUAL EXCITEMENT ON THE HURON RIVER IN MICHIGAN. PHOTOGRAPHS AND WRITTEN COMMENTS WERE OBTAINED FOR 2 STUDY GROUPS, THE FIRST ASKED TO PHOTOGRAPH ANYTHING POSITIVE AND THE SECOND ANYTHING NEGATIVE AS THEY CANOED THE RIVER. THROUGH CONTENT ANALYSES OF THE DATA, A SERIES OF POSITIVE AND NEGATIVE "UNIVERSAL PHOTOGRAPHS" (UP) EMERGED, AND DIFFERENCES IN PERCEPTION BETWEEN THE 2 STUDY GROUPS WERE REVEALED. ANALYSES FACTORS CONTRIBUTING TO THE FORMATION OF THE UP'S. USES THE UP'S TO FORM A PERCEPTUAL EXCITEMENT PROFILE FOR THE RIVER. PROPOSES WAYS TO APPLY THE VEP METHOD TO THE INTERPRETIVE PLANNING PROCESS.

C. RECREATIONAL USE OF HERITAGE RIVERS

Adams, Robert L. A. "The Demand for Wilderness Recreation in Algonquin Provincial Park." Clark University, 1966.

AMES, ROBIN S., REAM, ROBERT R.
1978. RECREATIONAL USE OF THE LOWER FLATHEAD RIVER.
28 P. WILDERNESS INST. AND MONTANA FOR. AND CONSERV. EXP.
STN., SCH. FOR., UNIV. OF MONTANA, MISSOULA, MONTANA.

PRESENTS THE RESULTS OF A 1977 SUMMER STUDY OF RECREATIONAL
USE ON A SEGMENT OF THE LOWER FLATHEAD RIVER IN MONTANA.
PRESENTS A WIDE RANGE OF INFORMATION ABOUT USE PATTERNS AND
AMOUNTS OF USE. ALSO PRESENTS INFORMATION ON THE MANAGEMENT
PREFERENCES OF USERS.

Bassett, John R., Beverly L. Driver, and Richard M. Schreyer. 1972. User study:
characteristics and attitudes Michigan's AuSable River. 78 p. Sch. Nat. Resour.,
Univ. Michigan, Ann Arbor, Michigan.

Discusses physical attributes of the AuSable River, biological impacts from human use,
and economic impacts on the area from tourism. A survey of river users was conducted
to determine user characteristics, conflicts among users, and other problems of use.

Benedetti, A. J. "Watersheds and Recreational Land Use in the Pacific
Northwest," American Water Works Association Journal, 56 (11)
(November, 1964), 1467-1473.

British Waterways Board. Leisure & The Waterways. London, 1967.

Brockman, C. F. Recreation Use of Wild Lands. New York: McGraw-Hill Book
Company, The American Forestry Series, 1959.

Bryan, Robert L. 1977. Canoeing use of Huron-Clinton Metropark. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 121-124. North Cent. For. Exp. Stn., St. Paul, Minnesota.

An urban regional Metropark system (Detroit area) continues to encourage use by canoeists of the Huron and Clinton Rivers. Unrestricted canoeing use has been encouraged by river inventory, maps, clean-up, and canoe rental concessions and facilities. Author suggests a need for different standards for urban rivers than for wild rivers. Believes these standards should include landscaped urban scenes and manufacturing sites as well as natural scenery. And, canoeing use should be unrestricted to alleviate social pressures of urban residents.

Bryan, Hobson. 1977. Leisure value systems and recreational specialization: the case of trout fishermen. J. Leisure Res. 9(2):174-187.

A conceptual framework of trout fishermen is developed around the concept "recreational specialization". This refers to a continuum of behavior from the general to the specialized. It is reflected by equipment, skills used, and preferences for specific recreation setting.

CARLS, E. GLENN.
1973. A SIMULATION MODEL OF WILD RIVER USE.
LEISURE SCIENCES 1(3): 209-218.

OUTLINES THE DEVELOPMENT OF THE WILD RIVER USE SIMULATION MODEL WHICH IS A COMPUTER SIMULATION FOR MEASURING AND EVALUATING ENCOUNTERS BETWEEN USER PARTIES AS TOTAL USE AND PATTERNS OF USE VARY. REPORTS THE RESULTS OF SEVERAL SIMULATION EXPERIMENTS ON A DEMONSTRATION WILD RIVER SYSTEM. THE FIRST SET, TESTS THE EFFECTS OF INCREASED TOTAL USE ON ENCOUNTER LEVELS BETWEEN PARTIES. THE SECOND SET EXAMINES THE REGULATION OF DAILY DISTRIBUTIONS OF USE DURING THE WEEK AS A METHOD FOR CONTROLLING PARTY ENCOUNTERS.

Carthorne, Richard. Wilderness recreation research: An annotated bibliography. p. 106. Council of Planning Librarians. November, 1978. 23 p. \$2.00 (U.S.). Copy location: Ministerial library, 14th Floor. 2-5051. P. 83. No.: P106.

Cieslinski, Thomas J. 1977. Allagash wilderness waterway. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 117-120. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes problems, solutions, and use experience during the first 10 years of managing the Allagash wilderness waterway. Problems related to increasing use include establishing public routes of access, registering users, dispersing users along the route of travel, restricting group sizes, establishing total use limits, and disposing of litter.

Coppock (JT) "The Recreation Use of Land and Water in Rural Britain Today" Tijdschrift voor Economic and Social Geography. 57 pp. 1966 81-96.

Cowgill, Peter. 1971. Too many people on the Colorado River. Natl. Parks Conserv. Mag. 45(11):10-14.

Cites problems of increasing use on the Colorado River through Grand Canyon National Park, Arizona. Problems resulting from the disposal of waste are most acute. Current park management guidelines seek to control the number of users and to protect the most fragile environments. Two issues remain undecided for this section of the Colorado River: wilderness designation and the use of outboard/inboard motors.

DARTINGTON AMENITY RESEARCH TRUST (1973c) Canals Around Braunston,
Water Recreation Case Study 4, Report to the
Sports Council and the Countryside Commission,
Dartington: D.A.R.T. c200pp.+ Statistical
Appendix.

SURVEYS OF USERS: 3700

CANALS
BOATING
FISHING

As part of a comprehensive study of this area of canals in the Northamptonshire/Warwickshire border area, a number of user surveys was mounted, including postal questionnaire surveys of boat owners and hirers, and interview surveys of anglers and canal users. Questions were asked about desired improvements to the canals. Anglers wanted cleaning and dredging of the canal and improvements to the tow path. Casual visitors also wanted to see improvements to the tow path. Boat owners were asked if their enjoyment of the canal was being disturbed: 22% said 'yes', 60% of these blaming other boats' speeding. 57% of anglers were disturbed by boats. Only 10% of canal users claimed to be affected by crowding.

Dekker, Emily A. 1976. Private use of
the Colorado River in the Grand Canyon
and Canyonlands National Parks.
Interim Rep. 38 p.

DITTON, ROBERT B., GRAEFE, ALAN R., MERTENS, THOMAS J.
1977. RIVER ROAD CAMPING IN BIG BEND NATIONAL PARK: A SURVEY
AND ANALYSIS.
74 P. TEXAS AGRIC. EXP. STN., TEXAS A & M UNIV., COLLEGE
STATION, TEXAS.

REPORTS THE RESULTS OF A STUDY OF RIVER ROAD CAMPERS ALONG
THE RIO GRANDE RIVER IN BIG BEND NATIONAL PARK IN TEXAS. A
MAIL QUESTIONNAIRE WAS SENT TO A SAMPLE OF PERSONS WHO HAD
OBTAINED BACKCOUNTRY PERMITS DURING THE YEAR FEBRUARY 1975-
FEBRUARY 1976. PRESENTS INFORMATION ON 1) CHARACTERISTICS OF
CAMPING PARTIES, 2) PATTERNS OF VISITATION, 3) ATTITUDES
TOWARD ENVIRONMENTAL IMPACTS BY HUMANS AND LIVESTOCK,
4) REASONS FOR RIVER ROAD CAMPSITE CHOICE, AND
5) SATISFACTION WITH THEIR EXPERIENCE.

DONHEFFNER, PAUL, MUCKLESTON, KEITH.
1976. MOTORBOAT USE ON THE WILD ROGUE RIVER: AN
INVESTIGATION OF USE BETWEEN WATSON CREEK AND BLOSSOM BAR.
OREGON STATE UNIV. REP. WR11-52, 60 P. WATER RESOUR. RES.
INST., OREGON STATE UNIV., CORVALLIS, OREGON.

REPORTS THE RESULTS OF A STUDY TO DETERMINE HISTORICAL AND
PRESENT LEVELS OF PRIVATE MOTORBOAT USE ON A SECTION OF THE
ROGUE RIVER CLASSIFIED AS "WILD". FINDINGS INCLUDE THE
IDENTIFICATION OF INCREASED MOTORIZED USE, CONSIDERABLE
VARIATION IN THE SPATIAL AND TEMPORAL PATTERNS OF MOTORIZED
USE, REASONS FOR PRIVATE MOTORBOAT USE, AND PROBLEMS
ENCOUNTERED BY PRIVATE MOTORBOATERS.

Elliott, Robert L. 1977. Commercial river outfitting: its educational role and responsibilities to the future. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 213-219. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Three trends are postulated: (1) a decrease in the rate of demand for commercial outfitting services, (2) an increase in demand for "do-it-yourself" trips, and (3) an increase in governmental regulations. The competition between commercial outfitters and private groups on restricted rivers is explored. Suggests that commercial outfitters can be justified for both their "educational" and "public access" services; the outfitter who so justifies his existence can enjoy a greater freedom from worry over future survival.

Fleener, George G. 1971. Recreational use
of the Platte River, Missouri. p. 63-78
In Stream Channelization Symp. Proc.,
Spec. Pub. 2. North Cent. Div. Am.
Fish. Soc.

Fleener, George G. 1975. Recreational use
of Grand River. Prog. Rep., D-J Proj.
F-I-R-24, Study S-17, Job 1, 11 p.
Missouri Den. Conserv

Gibbs, Kenneth C. 1973. A measure of
outdoor recreational usage. Agric.
Sci. Dep., Rep. 52, 51 p., Univ.
Florida, Gainesville, Florida.

Haas, J. Eugene, Nielsen, Joyce M., and Shelby, Bo. 1974. Progress report 1, river contact
study. Grand Canyon, Ariz.: National Park Service.

HAMILTON, LAWRENCE
1970. WATER USES AND WATER DEVELOPMENT IN FALL CREEK--
POSSIBLE CONFLICTS.
CORNELL UNIV. WATER RESOUR. AND MARINE SCI. CENT., PUBL. 31,
14 P. ITHACA, NEW YORK.

DESCRIBES THE FALL CREEK WATERSHED, ITS WATER USES AND
PROBLEMS, AND RECREATIONAL, AESTHETIC AND SCIENTIFIC USES.
DISCUSSES THE CONFLICTS BETWEEN THE DIFFERENT USES THAT
MIGHT OCCUR WITH DEVELOPMENT OF FALL CREEK.

Haydon, P.S. 1974. "Snake River Boat Use." USDI - National Park Service,
Grand Teton National Park.

Information was collected for use in development of the Snake River
management plan. Includes data on commercial and private boat
use.

Hecock, Richard D. 1977. Recreational usage and users of rivers. In: River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 279-284. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes trends in the recreational use of rivers by studying participation data and usage information. Identifies patterns of socio-economic and experiential characteristics of users. Evaluates existing data and assesses data needs on river recreation use and users.

HENDEE, JOHN C. CLARK, ROGER N. DAILEY, THOMAS E.
1977. FISHING AND OTHER RECREATION BEHAVIOR AT HIGH-MOUNTAIN
LAKES IN WASHINGTON STATE.
USDA FOR. SER. RES. NOTE PNW-304, 27 P. NORTHWEST FOR. AND
RANGE EXP. STN., PORTLAND, OREGON.

PRESENTS THE RESULTS OF A 2 YEAR PARTICIPANT OBSERVATION
STUDY OF RECREATIONAL ACTIVITIES AT SEVEN HIGH-MOUNTAIN
BACKCOUNTRY LAKES IN WASHINGTON STATE. FINDINGS INCLUDE
THAT ACCESS-RELATED FACTORS SEEM TO ACCOUNT FOR THE AMOUNT
AND KIND OF USE AT THE LAKES, THAT FISHING WAS ONLY ONE OF A
VARIETY OF REASONS FOR VISITING THE LAKES, AND THAT FOR MOST
ANGLERS CATCHING FISH WAS NOT THE MAIN REASON FOR FISHING.
DISCUSSES IMPLICATIONS OF THE FINDINGS FOR HIGH-LAKE
MANAGEMENT. DISCUSSION HAS RELEVANCE FOR RIVER RECREATION
MANAGEMENT.

Holje H. 1963. "Recreational Uses of Lands and Water in the Great
Plains and Intermountain West." Journal of Farm Economics,
45: 1101-1109.

Holman, Mary A. and James T. Bennett. 1973. "Determinants of Use
of Water-Based Recreational Facilities." Water Resources
Research, 9: 1208-1218.

Hunt, John D., J. J. Kennedy, N. E. West, W. J.
Barmore, and H. Eklund. River use in Dino-
saur N.M.--An interim report. Logan, Utah:
ISORI, Utah St. Univ. May 1973. 42 pp.
(\$5.00)

James, George A. 1971. Inventorying recreation use. p. 78-95 In Forest Recreation Symp. Proc., October 12-14, New York State Univ., Coll. For., Syracuse, New York.

James, George A., H. Peter Winkle, and James D. Griggs. 1971. Estimating recreation use on large bodies of water. USDA For. Serv. Res. Pap. SE-79, 7 p. Southeast. For. Exp. Stn., Asheville, North Carolina.

Describes a pilot sampling technique, originally tested on East Lake and Paulina Lake in Oregon in 1968, for estimating recreational use on large bodies of water. Includes recommendations for future sampling. Sampling technique included both ground observation and aerial counts of boats on the lakes. Technique has application to measuring recreational use on rivers.

James, George A., Nelson W. Taylor, and Melvin L. Hopkins. 1971. Estimating recreational use of a unique trout stream in the coastal plains of South Carolina. USDA For. Serv. Res. Note SE-159, 1 p. Southeast. For. Exp. Stn., Asheville, North Carolina.

Presents results of a study conducted to estimate fishing use on a small trout stream in South Carolina. Simple random sample estimation procedures were tested and information was obtained for further refinement in use and cost estimation for trout fishing. Use was highly localized and only small costs were involved for fishing. Recreation and intangible benefits outweighed economic expenditures by fishermen.

Johnston, Scott R. E. "Recreational Boating on the Rideau Waterway." Carleton University, 1969.

Knetsch, J. L. 1969b. "Assessing the Demand for Outdoor Recreation." Journal of Leisure Research, 1: 85-87.

Knopp, T. B., and L. C. Merriam Jr. 1976. "Work Plan - A Baseline Study of Recreational Use of Rivers: The Kettle River of Minnesota 1975 - 1976" College of Forestry, University of Minnesota, U.S.F.S. North Central Forest Experiment Station, and Minnesota Department of Natural Resources.

Study purpose is to establish a baseline questionnaire/interview schedule and a monitoring system to standardize the collection of data. Data will provide information on river users--their behaviour and preferences--so as to assist in making rational management decisions.

KNOPP, T. B., MERRIAM, L. C., JR BALLMAN, G. E.
GRUMSTRUP, P.
1979. THE KETTLE - MINNESOTA'S FIRST WILD RIVER - ITS USE
AND USER PREFERENCES.
UNIV. MINNESOTA AGRIC. EXP. STN., MISCELLANEOUS REP.
160-1979, FOR. SERIES NO. 28, 35 P. ST. PAUL, MINNESOTA.

DISCUSSES A 3 YEAR 1975-1977 STUDY OF RECREATIONAL USE ON THE KETTLE RIVER IN MINNESOTA. DEVELOPED A SURVEY QUESTIONNAIRE AND SAMPLING SYSTEM TO SOLICIT INFORMATION ON TRIP CHARACTERISTICS, USER PREFERENCES AND SATISFACTION, USER EXPERIENCE, AND USER CHARACTERISTICS. DESCRIBES TEMPORAL AND SPATIAL PATTERNS OF USE IN GRAPHIC TERMS TO FACILITATE COMPARISONS. MEASURES USER PREFERENCES FOR ELEMENTS IN THE RIVER ENVIRONMENT. USES CLUSTER ANALYSIS TO IDENTIFY GROUPS OF ELEMENTS WHICH CORRELATE ACCORDING TO PREFERENCE.

LEATHERBERRY, EARL
1979. MINNESOTA CANOE AND KAYAK OWNERS: THEIR
CHARACTERISTICS AND PATTERNS OF USE.
USDA FOR. SERV. RES. PAPER NC-171, 8 P. NORTH CENT. FOR.
EXP. STN., ST. PAUL, MINNESOTA.

PRESENTS THE RESULTS OF A MAIL QUESTIONNAIRE STUDY OF MINNESOTA CANOE AND KAYAK OWNERS IN 1977. MINNESOTA IS ONE OF 5 STATES REQUIRING THE REGISTRATION OF PADDLE CANOES AND KAYAKS, FROM THE JANUARY 1977 REGISTRATION DATA, THE PRIVATE CRAFT OWNERS RESIDING IN MINNESOTA WERE SAMPLED FOR THE STUDY. COMPARES SOCIOECONOMIC CHARACTERISTICS OF CANOE AND KAYAK OWNERS WITH THE MINNESOTA POPULATION. MEASURES AND EVALUATES CANOEING/KAYAKING EXPERIENCE. DESCRIBES USE CHARACTERISTICS FOR APRIL-OCTOBER 1977. DISCUSSES IMPLICATIONS OF FINDINGS FOR MANAGEMENT.

Lime, D. W. 1976. Wilderness Use and Users: A Summary of Research, in Proceedings of the 54th Annual Winter Meeting, Alleghany Section, Society of American Foresters, Dover, Delaware, February 3-6, 1976.

A summary of some of the results of social research conducted in the United States. These are summarized under two hearings: (1) general conditions of wilderness use; and (2) general factors influencing wilderness experiences. This is a very general summary of some of the findings. Although limited in scope, is useful for gaining a general overview on the subject.

Lucas, Robert C. 1964a. Recreation use of the Quetico-Superior Area. USDA For. Serv. Res. Pap. LS-8, 50 p., Lake States For. Exp. Stn., St. Paul, Minnesota.

Lucas, R.C. (1965) The Importance of Fishing as an Attraction and Activity in the Quetico-Superior Area, Research Note LS-65, St. Paul, Minn.: U.S. Dept. of Agriculture, Forest Service, Lake States Forest Experiment Station, pp. 3.

Data from a broader survey is used to investigate the relative importance of fishing in the recreation experience. When asked what particularly attracted them to the area, more mentioned scenery, lack of crowds, etc. rather than fishing.

Having been attracted by fishing, and doing a lot of it was not correlated with satisfaction - people were often dissatisfied.

Lucas, Robert C. and Jerry L. Oltman. 1971. "Survey Sampling Wilderness Visitors." Journal of Leisure Research, 3: 28-43.

Lee, John. 1975. Collection and analysis of visitor use information: proposed upper Missouri wild and scenic river. 32 p. West. Interstate Commun. Higher Educ. and Dep. Recreation Park Manage. Univ. Oregon, Eugene, Oregon.

Presents data on visitor use from a 1975 study on the upper Missouri River by the Bureau of Land Management. Describes patterns of visitor use and develops user profiles based on socio-economic characteristics. Makes suggestions on regulating river use and provides guidelines to develop an informational guide for river floaters.

LIME, DAVID W.

1972

Large groups in the Boundary Waters Canoe Area - their numbers, characteristics, and impact. North Central For. Exp. Stn., St. Paul, Minn. USDA For. Serv. Res. Note NC-142, 4p.

The impact of "large" parties (9 persons or more) in the BWCA is discussed in terms of their effect on the resource and on the experience of other visitors. The amount of use by large groups and the visitors most likely to be effected by a reduction in party size limit are described. (Present BWCA party size limit is 15). Large parties do not represent a large proportion of total parties, but do account for a substantial percentage of total visitors and visitor days of use. Large parties typically travel by paddle canoe, visit the Area predominantly in mid-summer, do not reside in northeastern Minnesota, are organizational youth groups not based near the BWCA, and are out-fitted to some extent. For current use patterns, the impact of large groups on the environment and on the experience of other visitors is greater than that of an equal number of people visiting the Area in small groups. Large parties characteristically stay longer, move camp more often, and penetrate farther back into the back country than small parties. Lime states that similar characteristics might exist for other roadless and dispersed recreation areas.

Lime, David W., and Roland G. Buchman.

1973. Boundary Waters Canoe Area visitor-use estimates from mandatory travel permits--1972. Office Rep., 92 p., North Cent. For. Exp. Stn., St. Paul, Minnesota.

Lime, David W., and Grace A. Lorence.

1974. Improving estimates of wilderness use from mandatory travel permits. USDA For. Serv. Res. Pap. NC-101, 7 p., North Cent. For. Exp. Stn., St. Paul, Minnesota.

Lucas, R. C. 1973. The Status of Recreation Research Related to Users, Proceedings of Society of American Foresters, 127:130.

Magill, Arthur W. 1970. Five California campgrounds...conditions improve after 5 years' recreational use. USDA For. Serv. Res. Pap. PSW-62, 18 p., illus. Pac. Southwest For. & Range Exp. Stn., Berkeley, California.

Maine Department of Conservation, Bureau of Parks and Recreation. 1974. 1973 survey of Allagash Wilderness Waterway visitor use and visitor use characteristics. 64 p. Augusta, Maine.

Presents results of surveys conducted in 1967 and 1972 of use on Maine's Allagash Wilderness Waterway. Data were collected on patterns of use and characteristics and motives of river users. Presents trends in visitor use since 1966. Concludes that because of congestion and user conflicts, efforts should be made to: (1) redistribute use over time and space, (2) separate small and large groups, and (3) develop separate sites for vehicle camping and picnicking from river floaters.

Marnell, Leo F. 1975. Use of time-lapse photography for estimating canoe use on the Ozark National Scenic Riverways. Paper presented at Workshop for Outdoor Recreation Researchers and Cooperators, March 9-12, 10 p., Land Between Lakes, Tennessee.

Marnell, Leo F. 1977. Methods for counting river recreation users. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 77-82. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Recreation users on the Nation's rivers should be counted and classified. Procedures for documenting river use are reviewed and the merits and limitations of various approaches are discussed.

Mansfield, N.W., "Recreational Trip Generation: A Cross Section Analysis of Trips to the Lake District National Park".
Journal of Transport Economics and Policy 3(2) May 1969 p152-164

Mead, Richard R. and Ehremreich, Joseph W. Recreational Uses of the Lower Colorado River Valley Los Angeles, Research Institute for Business and Economics University of Southern California 1969

Moon, Frances. "Angling & Pleasure Boating on Inland Waterways."
Recreation News Supplement, No. 6, 1972, pp. 27-29.

Merriam, L. C., Jr., and Timothy B. Knopp. 1977. The complex uses of an accessible river--the Kettle of Minnesota. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 312-319. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Minnesota's Kettle River provides a wide range of recreation attractions--whitewater kayaking, canoeing, fishing, and boating--within 100 miles of the Minneapolis-St. Paul metropolitan area. Initial results of a 1975-1976 study to develop baseline visitor data and a means of monitoring use suggest a complex of uses, visitor types, and river conditions.

McCool, Stephen F., and S. M. Haydock. 1976. Hikers of the Virgin River Narrows, Zion National Park. Institute for the Study of Outdoor Recreation and Tourism. 80 p. Utah State Univ., Logan, Utah.

Presents results of a 1976 summer study of day users and campers hiking in the Narrows. Data were collected and analyzed on: (1) total recreational use of the area, (2) socio-demographic characteristics of users, (3) recreational activity patterns, and (4) perception of users to hazards in the Narrows. Results showed that campers in the Narrows tended to be former day users. Also, although more than half the users were aware of the severe flash flood hazard in the area during the summer months, they were unaware of the probability of such a flood occurring.

McCool, Stephen F., and Lawrence C. Merriam, Jr. 1971. Camper-outfitter interaction and the Boundary Waters Canoe Area, Superior National Forest, Minnesota. Minnesota For. Res. Note 225, 4 p. Sch. For., Univ. Minnesota, St. Paul, Minnesota.

Focuses on describing the communication processes of outfitters and wilderness visitors. In particular, identifies visitors' information sources and levels of knowledge about the Area and their attitudes on several important management policy issues.

Matzat, Howard, John Benedict, and Dennis Myers. 1974. Land management report of users along the Stanislaus, Mokelumne, and Merced Rivers, during 1974. 27 p. Bur. Land Manage., Folsom Dist., Folsom, California.

Reports results of a 1974 spring survey of recreation use on the Stanislaus, Mokelumne, and Merced Rivers of California. Also presents a method for collecting future recreation use data.

Munley, Vincent G., and V. Kerry Smith. 1976. Learning-by-doing and experience: the case of whitewater recreation. Land Econ. 52(4):545-553.

A household production model is used to show the impact of user experience on consumer behavior. Suggests that the more often an individual engages in an activity, such as white-water boating, the more skilled the person becomes at the activity and the more demanding the person is of a recreational site's services. Concludes that as experience and skill increase, a positive effect on the person's willingness to pay is observed but tends to level off as the desired degree of skill is reached.

Nielsen, Joyce McCarl, Bo Shelby, and J. Eugene Haas. 1975. Sociological carrying capacity and the last settler syndrome. Colorado River Res. Ser. Contrib. 8, 24 p. Human Ecol. Res. Serv., Boulder, Colorado.

Reviews literature on social carrying capacity and concludes that problems exist when trying to quantify capacity. Suggests that traditional user satisfaction models are probably inadequate to explain social carrying capacity. First-time users to a recreational area may have one threshold for crowding whereas persons who have visited a site more than once probably have a different threshold for crowding.

O'LEARY, JOSEPH T. PATE, GARY.
1979. WATER-BASED ACTIVITY INVOLVEMENT FOR RECREATION
CONSUMERS AT STATE, FEDERAL, LOCAL OR PRIVATE FACILITIES.
WATER RESOUR. BULL. 15(1):182-188.

EXAMINES PARTICIPANTS AT FEDERAL AND STATE, AND LOCAL AND PRIVATE FACILITIES INVOLVED IN 8 WATER RELATED ACTIVITIES IN INDIANA. FINDS NO DIFFERENCES AMONG ACTIVITY PARTICIPATION RATE GROUPS WITH RESPECT TO 7 SOCIOECONOMIC CHARACTERISTICS AT THE DIFFERENT PROPERTIES. FINDS THAT GROUPS OF HIGHLY ACTIVE PARTICIPANTS ARE RESPONSIBLE FOR A DISPROPORTIONATE AMOUNT OF PARTICIPATION IN EVERY ACTIVITY AT BOTH TYPES OF PROPERTIES. SUGGESTS THAT SOCIAL ACTION SYSTEM VARIABLES BE INCLUDED TO STUDY DIFFERENCES IN PARTICIPATION.

Pfister, Robert E., and Robert E. Frenkel. 1974. Field investigations of river use within the wild river area of the Rogue River, Oregon. Rogue River Study Rep. 1, 108 p. Dep. Geogr., Oregon. State Univ., Corvallis, Oregon.

Summarizes 1974 field survey to determine recreational carrying capacity and use levels along the federally designated wild area of the Rogue River. Revealed differences between commercial and noncommercial river travelers with respect to occupation, number of previous river trips, and membership in conservation organizations. Differences were also noted in commercial and noncommercial user's attitudes towards levels of crowding and potential use restrictions. River campsites were inventoried with respect to availability of potable water and enough flat ground to accommodate a camping party of four.

Pfister, Robert E. and Robert E. Frenkel
1976 Rogue River Study-Report 1. Field Investigations of River
Use Within the Wild River Area of the Rogue River, Oregon.
Corvallis: Water Resources Research Institute.

Recreation Resource Consultants. 1972. 1971 Michigan recreational boating study.
Recreation Res. Consultants Rep. 2, 128 p. East Lansing, Michigan.

Presents results of the fourth Statewide boating survey. Questionnaires were used to obtain information on the amount, distribution, and nature of recreational boating by registered boaters in 1971. Estimates probable future boating use in Michigan and develops computer mapping techniques to show current and future distribution of boat use. Logistical problems of three previous Michigan boating studies are reviewed and recommendations are given on ways to improve future studies.

Seitz, William K., III. 1974. Patterns of recreational use and characteristics of users of the Upper Iowa River. Ph.D. diss. Iowa State Univ., Ames, Iowa. 193 p.

Examines recreational use on a 74-mile section of the Upper Iowa River in northern Iowa during 1972-1973. Data collected through personal interviews with river users and aerial counts were analyzed to identify the characteristics of users, use patterns, and user perceptions. Canoeing was the most popular and camping was the second most popular activity. Most canoeists used the river on weekends and holidays. Most users felt the river was becoming too crowded but wanted more facilities (campsites, tables, toilets, etc.) provided. Suggests that canoeing be dispersed more evenly to alleviate crowding.

Seitz, William K., and Robert B. Dahlgren. 1975. Water-based recreational use patterns of the Upper Iowa River. Iowa State J. Res. 50(2):131-145.

Describes a 1972-1973 study of recreational use on the Upper Iowa River. Canoeing, camping, fishing, and trapping activities were recorded and each were found to occur in distinct areas of the River (i.e., canoeing did not occur where trapping was popular). Canoeists and campers used the River more than fishermen or trappers. More than half of the canoeing and camping was on weekends and holidays.

Shechter, Mordechai. 1975. Simulation Model of Wilderness-Area Use: Model-User's Manual and Program Documentation. Washington, D.C.: Resources for the Future.

Shelby, Bo, and Joyce McCarl Nielsen. 1976. Design and method of the sociological research in the Grand Canyon. River Contract Study Final Rep. Part I, 32 p. Human Ecol. Res. Serv., Inc., Boulder, Colorado.

A pilot study of 11 trips was conducted during the 1974 river running season on the Colorado River through Grand Canyon. Final data was collected during the 1975 season by a stratified random sample of 46 commercial trips (39 motor and 7 oar) and 7 private trips. Four self-selected motor-oar combination trips provided additional data. Information sources included Park Service use records, trip reports by observers, and questionnaires and interviews from passengers and boatmen.

Shelby, Bo, and Joyce McCarl Nielsen. 1976. Motors and oars in the Grand Canyon. River Contract Study Final Rep. Part II, 42 p. Human Ecol. Res. Serv., Inc., Boulder, Colorado.

The effects of motor and oar trips in the Grand Canyon are discussed. Brief history of the controversy over motorized river travel is presented. Data on motor-oar differences come from two sources: people who were on either a motor or oar powered trip and people who were on a combination motor and oar powered trip. Combination trip passengers reported a clear preference for the oar trip. Implications for management are that (1) oar travel appears more compatible with the wilderness experience, and (2) a major increase in the proportion of oar travel would cause a number of changes in the river running scene.

Shelby, Bo, and Joyce McCarl Nielsen. 1976. Private and commercial trips in the Grand Canyon. River Contract Study Final Rep. Part IV, 30 p. Human Ecol. Res. Serv., Inc., Boulder, Colorado.

Discusses the history of the private-commercial river trip controversy and summarizes arguments on both sides. Private and commercial users differ on a number of background variables and trips differ on structural characteristics. As a whole, the attitudes and perceptions of private users differ from those of commercial users, but are similar to those of commercial passengers taking oar-powered trips. Implications for management are discussed.

Shew, Richard L., and Michael P. Werner. 1976. Recreation use patterns and user attitudes on the Snake River. Final Tech. Rep., 114 p. Water Res. Cent., Washington State Univ., Pullman, Washington.

During the summer of 1971 mail-back questionnaires concerning the changes a proposed dam would have on recreational activities in the area were distributed to a sample of recreation users on the Snake River, Washington. Data showed that nearly all of the recreationists lived within 2 hours driving time from the River and that the River was their primary destination. Users were predominantly young to middle-aged and well-educated. The most popular recreation activities were sightseeing, fishing, hunting, picnicking, swimming, and relaxing. Most users felt present recreation opportunities were fair to excellent and that the dam would decrease the number and kinds of recreational activities available and cause overdevelopment of the area.

Schn, Arnold J., and Arnold O. Haugen. 1969. How do Iowans use their lakes for recreation? Iowa Farm Sci. 23(9):8-9.

Studied competitive recreational uses on the Clear, Spirit, Okoboji, and Little Wall Lakes in Iowa during 1966-1967. Used pneumatic car counters, questionnaires, and time-lapse photography to describe recreational activity cycles on the lakes. Determined present and future areas of user conflict. Made the following recommendations to managers: limit boat size, zone lake areas by types of recreational uses, and manage waterfowl.

STONE, GREGORY P., AND MARVIN J. TAVES

1958 Camping in the wilderness. P. 290-305, in: Mass Leisure. Eric Larrabee and Rolf Myersohn (eds.). Glencoe, Ill.: The Free Press.

"Describes the demographic characteristics of wilderness users, the various kinds of wilderness users in the Boundary Waters Canoe Area, and outlines some of the important 'images' wilderness users hold for the area. One of the very first wilderness user studies." (Lucas and Stankey, 1973).

Stroud, Richard H. "Recreational Use of Watersheds, Conservationist's View," American Water Works Association Journal, 58 (October, 1966), 1263-1270.

Sublette, Werner J., and William E. Martin.
1975. Outdoor recreation in the salt-verde basin of central Arizona: demand and value. Arizona Agric. Exp. Stn., Tech. Bull. 218 41 p.

TAVES; MARVIN, WILLIAM HATHAWAY, AND GORDON BULTENA

1960 Canoe country vacationers. Agri. Exp. Sta., Univ.
Minnesota Misc. Rep. No. 39, 28p., illus.

This is a field study of campers and canoeists who vacationed in the Quetico-Superior during the summer of 1958. Its primary objectives were to obtain data on who vacations in the area, for what reasons, and with what effects; what these vacationers think of the area; and what they would like done with it. This is an early study of wilderness users which applies less sophisticated techniques but the results still revealed patterns which later studies have shown. (Also, see by Gregory P. Stone and Marvin Taves, "Research into the Human Element in Wilderness Use", Proc. Soc. Amer. Foresters (Memphis, 1956): 26-32. Reprinted as "Camping in the Wilderness" in: Mass Leisure, P. 290-305. Eric Larrabee and Rolf Meyersohn (eds.). Glencoe, N.Y.: The Free Press, 1958).

Tanner, M.F. "The Recreational Use of Inland Waters."
Geographical Journal, Vol. 139, 1973, pp. 486-491.

Tennessee Department of Conservation. 1976.
Responses to survey questionnaire--
river recreation in the East: trends
in use and management.

Bureau of Outdoor Recreation, Department of the Interior. 1967.
Water-Oriented Outdoor Recreation in the Lake Huron Basin.
Ann Arbor, Michigan: Bureau of Outdoor Recreation, 1967.

Bureau of Outdoor Recreation, Department of the Interior. 1967.
Water-Oriented Outdoor Recreation in the Lake Michigan Basin.
Ann Arbor, Michigan: Bureau of Outdoor Recreation, 1967.

Bureau of Outdoor Recreation, Department of the Interior. 1967.
Water-Oriented Outdoor Recreation in the Lake Ontario Basin.
Ann Arbor, Michigan: Bureau of Outdoor Recreation, 1967.

U.S. Department of Army, Corps of Engineers. "Evaluation of Recreation Use Survey Procedures." Plan Formulation and Evaluation Studies--Recreation. Technical Report No. 1. Washington, D.C., October 1969.

Bureau of Outdoor Recreation, Department of the Interior. 1967.
Water-Oriented Outdoor Recreation in the Lake Superior Basin.
Ann Arbor, Michigan: Bureau of Outdoor Recreation, 1967.

Bureau of Outdoor Recreation, Department of the Interior. 1967.
Water-Oriented Outdoor Recreation in the Lake Erie Basin.
Ann Arbor, Michigan: Bureau of Outdoor Recreation, 1967.

U. S. National Park Service. Recreation - Colorado River Valley. Washington
D.C.: Government Printing Office, 1950.

Wehrung, Patrick. 1975. Participation in
large group trips at Ozark National
Scenic Riverways. 50 p. M.S. Thesis
on file at Dep. For., South. Illinois
Univ., Carbondale, Illinois.

Welton, Brad, and Dick Harlow. 1973. California B.L.M. white-water use study. 72 p.
USDI Bur. Land Manage. Folsom Dist., Folsom, California.

Summarizes the summer 1973 study on volume and use on the Stanislaus River in northern California. Also covers recreational use data collected for Mokelumne, Consumnes, South Fork of American, Merced, and Tuolumne Rivers. Contains information on the Stanislaus River about hazards, congestion at access and special interest points along the river, camping and picnicking sites, water quality, firewood availability, sanitation facilities, and types and volume of whitewater recreation use. Concludes that increased use of the Stanislaus has caused lowered water quality and serious crowding problems. Also includes information on the volume of recreational use the Mokelumne, Consumnes, Merced, Tuolumne, and South Fork of the American Rivers received.

I. Whitman, Battelle Memorial Institute, Columbus, Ohio.
Evaluating Urban Core Usage of Waterways and Shorelines.
Water Resources, Physical Components, Inland Rivers,
Water-related shoreline, Socio-Economic Factors,
Political factors, Government interaction 1969
U.S. Dept. of Interior
Office of Water Resources Research
Washington, D.C.

Witty, K., 1975. A Comparison of Recreational Use at Cache Creek on the
Middle of Snake River 1969 and 1974. Oregon Department of Fish and Wild-
life.

Report contains findings of a river use and "recreational experience"
survey. Findings indicated that viewing wildlife and being in natural
environments contributed positively to the experience, while the presence
of man-made features and encountering other parties were negative factors.
Contains copy of questionnaire and discussion of sample design.

D. USER PREFERENCE AND CARRYING CAPACITY STUDIES

Aitchison, Stewart. 1976. Human impact on the Grand Canyon. Down River 3(4):18-19.

Documents increasing use of the Colorado River through Grand Canyon National Park for river running and resulting biological and sociological problems. Outlines a recent National Park Service research project to determine carrying capacities and the effect of the Glen Canyon Dam on the riparian environment. Suggests restrictive management of biologically sensitive areas within the Canyon as an alternative to limiting total numbers of rafters.

Altman, Irwin. 1975. The environment and social behavior: privacy, personal space, territory, crowding. p. 146-167. Brooks-Cole Publ. Co., Monterey, California.

BALLMAN, GARY, KNOPP, TIMOTHY B. MERRIAM, L. C., JR
1978. PREFERENCES OF MINNESOTA CANOE ASSOCIATION MEMBERS
COMPARED TO KETTLE RIVER USERS.
MINNESOTA FOR. RES. NOTE 269, 4 P. COLL. FOR., UNIV.
MINNESOTA, ST. PAUL, MINNESOTA.

PRESENTS THE RESULTS OF A STUDY TO DETERMINE TO WHAT EXTENT THE OPINIONS OF ORGANIZED RECREATION USER GROUP MEMBERS DIFFER FROM OR AGREE WITH THOSE OF THE RESOURCES' GENERAL USER POPULATION. QUESTIONNAIRES WERE ADMINISTERED TO A SAMPLE OF MINNESOTA CANOE ASSOCIATION MEMBERS AND TO A SAMPLE OF WATERCRAFT USERS ON THE KETTLE WILD AND SCENIC RIVER. THE 2 GROUPS HAD GENERALLY SIMILAR PREFERENCES FOR RIVER RECREATION ENVIRONMENTS AND MANAGEMENT ALTERNATIVES CONSISTENT WITH THE PREFERENCES. ORGANIZED GROUP MEMBERS TENDED SLIGHTLY TOWARD MORE NATURAL ENVIRONMENTS AND STRICTER MANAGEMENT POLICIES.

Earon, Norman J. E., James Cecil, and Philip L. Tideman. 1972. A survey of attitudes towards the Mississippi River as a total resource in Minnesota. Water Resour. Res. Cent. Bull. 55, 160 p. Univ. Minnesota, Minneapolis, Minnesota.

A survey of Minnesotan attitudes toward the use of the Mississippi River in Minnesota was conducted in 1971. Significant findings are that Minnesotans do not desire to curtail their uses of energy to improve the River's environmental quality, and that perceived present uses of the River are opposite to the uses of what the public desires.

Birch, D., and J. Veroff. 1966. Motivation:
a study of action. 98 p. Brooks-Cole,
Belmont, California.

BORDEN, F. Y.
1976. USER CARRYING CAPACITY FOR RIVER-RUNNING THE COLORADO
RIVER IN THE GRAND CANYON.
USDI NAT. PARK SERV., COLORADO RIVER RES. SERIES TECH. REP.
9, 79 P. GRAND CANYON NAT. PARK, GRAND CANYON, ARIZONA.

STUDY CONDUCTED TO DETERMINE NUMERICALLY THE VISITOR
CARRYING CAPACITY FOR RIVER RUNNING THE COLORADO RIVER.
DEVELOPED A SCHEDULING SYSTEM TO BE INITIATED WITH A
CARRYING CAPACITY SYSTEM, SUBJECT TO ENVIRONMENTAL
CONSTRAINTS. ALSO EXAMINED MONITORING, MANAGEMENT AND
MAINTENANCE PLANNING.

Boster, Mark A. 1972. Colorado River trips within the Grand Canyon National Park
and Monument: a socio-economic analysis. Dep. Hydrol. Water Resour. Rep. 10, 83 p.
Univ. Arizona, Tucson, Arizona.

Surveys river runners on the Colorado River through the Grand Canyon in Arizona to establish
a social carrying capacity. Includes socio-economic information about users; user motives,
expectations, perceptions, and satisfaction; and perceptions of river managers.

Boster, M. A., R. L. Gum, and D. E. Monarchi. 1973. A socio-economic analysis
of Colorado River trips with policy implications. J. Trav. Res. 12(1):7-10.

Summarizes a study on the perceptions, expectations, and interactions of recreation users
on the Colorado River through Grand Canyon National Park, Arizona. Suggests using both
physical and biological factors to determine human carrying capacity of the Colorado River.

Brewer, Durward, and Glenn A. Gillespie. 1969. Socioeconomic factors affecting
participation in water-oriented outdoor recreation. USDA Econ. Res. Serv. ERS-403,
37 p. Washington, D.C.

Demand for water-oriented recreation by metropolitan populations can be estimated by assessing
socioeconomic characteristics such as income, education, sex, race, occupation, and amount of
leisure time. Results from a questionnaire given to St. Louis, Missouri, residents indicate
that families with white male heads of households engaged in more outdoor recreation than
families headed by nonwhites and women; demand for outdoor activities decreases with age;
and higher income groups have more leisure time, more opportunities for recreation, and
travel farther from home for outdoor recreation than do lower income groups.

Erickler, Stanley K., Douglas K. Larson, and Robert C. Johnson. 1974. Social carrying capacity of Grand Canyon Colorado River float trips: a conceptual framework. Inst. Renewable Nat. Resour. 40 p. Univ. Arizona, Tucson, Arizona.

Develops a three-phase conceptual framework for understanding and measuring aspects of social carrying capacity. Pretrip phase includes study of trip activity profiles, participant profiles, and user motivations. On-site phase includes study of actual float-trip where the individual encounters physical and perceptual sensations and experiences. Post-trip phase involves study of an individuals recollections about the float trip.

Brown, Perry J., and J. H. Schomaker.
1973. Recreation carrying capacity in wilderness: a series of topical papers. 105 p. Inst. for the Study of Outdoor Rec. and Tourism. Logan, Utah.

Brown, Perry J. 1975. Whitewater rivers: social inputs to carrying capacity based decisions. 34 p. Paper presented to the Whitewater River Manage. Conf., Moab, Utah.

Brown, Perry J., Beverly L. Driver, and George H. Stankey. 1976. Human behavioral science and recreation management. In XVI Int. Union For. Res. Organ. World Congr. Proc. Div. VI. p. 53-63. Vienna, Austria.

Carlson, John E. 1974. Attitudes of Idaho residents toward free flowing rivers as a water use in Idaho. Scenic Rivers Study Rep. 12, 59 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Survey of Idaho residents to: (1) identify the importance of natural resources compared to other issues (e.g., education) and (2) identify the importance of wild rivers as a water use. Concludes that major resource priorities were in the areas of utilization and preservation and that Idahoans should approach resource use from a balanced perspective. The controversial area of wild and scenic river classification was supported even though attitudes were somewhat polarized. Suggests that attitudes should not be taken at face value alone but evaluated with respect to a person's overall priority rankings of various resource

Cheek, N.H. and D.R. Field. 1977. "Aquatic Resources and Recreation Behaviour." Leisure Sciences 1(1): 67-85.

Cherem, Gabriel J. 1972. Looking through the eyes of the public. 10 p. Aesthetics Opportunity Colloquium Proceedings, Utah State University, Logan, Utah.

Christopherson, Kjell Arne. 1972. Report of an analysis of attitudes and opinions of St. Joe River basin landowners toward wild and scenic rivers. Scenic Rivers Study Rep. 2, 74 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Presents results of a survey of St. Joe River basin landowners on their attitudes and opinions towards the proposed inclusion of the St. Joe River in the National Wild and Scenic River System. Ascertains landowner/recreationist conflicts and the extent to which landowner's management policies and practices will be affected by such conflicts. Concludes that increasing public recreation facilities will substantially reduce such conflicts. Encourages active participation by private landowners in decision-making processes.

Christopherson, Kjell Arne. 1973. Attitudes and opinions of recreationists toward wild and scenic rivers: a case study of the St. Joe River. Scenic Rivers Study Rep. 9, 66 p. Water Resour. Res. Inst., Univ. Idaho, Moscow, Idaho.

Presents results of interviews with St. Joe River recreation users in 1971-1972. Focuses on the users attitudes and opinions toward the river's inclusion in the National Wild and Scenic River System. Responses favored river designation but concern was expressed for the intensity of development and recreational use the river might receive if designated.

Clark, Roger N., John C. Hendee, and F. L. Campbell. 1971. Values, behavior, and conflict in modern camping culture. J. Leisure Res. 3(3):143-159.

Clark, Roger N., John C. Hendee, and Robert L. Burgess. 1972a. The experimental control of littering. J. Environ. Educ. 4(2):22-28.

Clark, Roger N., John C. Hendee, and
Randel F. Washburne. 1972b. Litter-
bags: An evaluation of their use.
USDA For. Serv. Res. Note PNW-184,
5 p. Pac. Northwest For. & Range Exp.
Stn., Portland, Oregon.

Cohen, J. L., B. Sladen, and B. Bennett.
1975. The effects of situational
variables on judgements of crowding.
Sociometry 38(2):278-281.

Cole, Dennis Michael. 1970. Recreational
impact on forest sites in the Missouri
Ozarks. 103 p. Unpubl. Master's Thesis
on file at School of Forestry, Fisheries,
and Wildlife, University of Missouri,
Columbia.

Cooper, B.R. (1973) Factors Affecting Quality of Recreation Experience
For Trout Fishermen of Maramec Spring Park, M.A. thesis,
Department of Recreation and Park Administration, University
of Missouri, Columbia.

Cordell, Harold K., Gordon A. Hammon, John Graham, William L. Hafley, and M. Roger
Warren. 1975. Capacity of water-based recreation systems Part III: methodology and
findings. Water Resour. Res. Inst. Rep. 90, 109 p. North Carolina State Univ.,
Raleigh, North Carolina.

Develops methods, models, and guidelines for planning and managing water-based recreation
sites. Presents methods for collecting and processing data on the recreational behavior
of boaters. Finds that capacity, measured as the number of boats on the lake system at
the same time, is not a fixed number because most users seem to acclimate themselves to
heavy use periods.

Coughlin, R. E., T. R. Hammer, T. G. Dickert and S. Sheldon. 1972.
"Perception and Use of Streams in Suburban Areas: Effect of
Distance from Residence to Stream." Regional Science Research
Institute Discussion Paper No. 53, March 1972.

Countess, Michael L., Walter L. Criley, and B. R. Allison. 1977. Problems and
conflicts associated with river recreation programming and management in the East.
In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech.
Rep. NC-28, p. 147-150. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Increased river recreation has resulted in conflicts between landowners and users about
project development. The authors suggest that controversies typically are due to differ-
ent attitudes, values, and philosophies, and the failure of the managing agencies to
incorporate such considerations in river programs. Most problems and conflicts are
symptoms of an uninformed public.

Cowgill, Peter. 1971. Too many people on the Colorado River.
Nat'l. Parks & Conserv. Mag. (November): 10-14.

Abstract: With the ever increasing recreational use of the
Colorado River, harm to the river and its adjacent
environments has taken the form of oil, gas, and noise
pollution; littering; health and sanitation problems;
and damage to vegetation, wildlife, historic sites,
and prehistoric shrines. In 1968, pit toilets were
provided at designated campsites. Problems of human
waste sanitation became particularly acute. The
National Park Service now requires that all non-
burnable trash, garbage and wastes be carried out.
The most fragile areas are closed to camping. The
number of user-days have been limited. In 1971, two
proposals remained undecided: designation of the
Colorado River in wilderness classification and banning
of motors for river-running trips.

Keywords: Water Pollution, User Satisfaction, Waterway Preservation,
Boating, Arizona, Waterway Management, Waste Disposal.

DARTINGTON AMENITY RESEARCH TRUST (1973d) Yorkshire Ouse, Water
Recreation Case Study 5, Report to the Sports
Council and the Countryside Commission,
Dartington: D.A.R.T., c200pp. + Statistical
Appendix.

USER INTERVIEWS (1982)

RIVER
RECREATION
BOATING
FISHING

A series of self-completion and interviewer administered questionnaire surveys of boat owners and hirers, anglers and casual visitors included questions on disturbance caused by other users and crowding generally. 40% of anglers were disturbed by boats; only 7% of casual users claimed to be affected by crowding.

David, Elizabeth. "Effects of Nonprice Variables Upon Participation in Water-Oriented Outdoor Recreation: Comment." In American Journal of Agricultural Economics, Vol. 51, No. 4. November 1969, pp. 942-945.

Desor, J.A. 1972. Toward a psychological theory of crowding. J. Pers. & Soc. Psychol. 21(1):79-83.

Dillard, Annie. 1974. Pilgrim at Tinker Creek. Harper's Mag. Press.

Ditton, Robert B., David J. Schmidly, William J. Boer, and Alan R. Graefe. 1976. Data needs and analysis for evaluating human impact in the Rio Grande River Corridor of Big Bend National Park. p. 1-41 In 3rd Resour. Manage. Conf. Proc., National Park Service, SW Reg. Superintendent's Conf., April 29-30, Ft. Worth, Texas.

Ditton, Robert B., David J. Schmidly, William J. Boeer, and Alan R. Graefe. 1977. A survey and analysis of recreational and livestock impact on the riparian zone of the Rio Grande in Big Bend National Park. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 256-266. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Visitor use patterns, biological conditions, and selected items of recreational impact (including litter, trampling, tree cutting, and human waste) were measured for 12 months. Use and impact were shown to be strongly and positively correlated. However, recreational impact was not significantly related to the biological "health" of the area. Cluster analysis was used to group areas into three categories based on degree of impact; only one of every four sites was heavily impacted. Principal component analysis identified human impact features as best discriminators between sites.

Dolan, Robert, Alan Howard, and Arthur Gallenson. 1974. Man's impact on the Colorado River in the Grand Canyon. Am. Sci. 62(4):392-401.

Describes environmental changes that have occurred along the Colorado River through Grand Canyon National Park, Arizona, since the Glen Canyon Dam was constructed. Cites major impact the dam has had on water level fluctuations and the subsequent effects this change has had on the vegetation, fish, beach formation, and rapids along the river. Also notes the increased effect of human use on the ecology of the Canyon. Suggests that quantification of river trip activity is needed to cope with human impact in the canyon/river environment.

Driver, B. L., and John R. Bassett. 1975. Defining conflicts among river users: a case study of Michigan AuSable River. Naturalist 26(1):19-23.

Summarizes the findings of a 1971 Michigan study that examined the characteristics and attitudes of the river users (canoeists, fishermen, canoe outfitters, and cottage residents). Identifies primary areas of conflict as: (1) number and distribution of users, (2) motives of users, (3) user's perceptions of managerial problems, and (4) user reaction to controls on river use.

Driver, B.L. 1976a. Toward a better understanding of the social benefits of outdoor recreation participation. p. 163-189. In South. States Workshop on Research Application Proc. USDA For. Serv. Gen. Tech. Rep. SE-9. South-east For. Exp. Stn., Asheville, North Carolina.

Driver, B. L., and John R. Bassett. 1977. Problems of defining and measuring the preferences of river recreationists. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 267-272. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Discusses seven broad types of problems experienced while researching the preferences of recreationists on three rivers in Michigan. Those problem areas concerned the tasks of: (1) selecting variables to be included in research designs; (2) deciding which research approach is best suited for particular purposes; (3) designing sample plans; (4) collecting data in the field; (5) understanding the dynamics of human preference formation; (6) defining the word preference; and (7) specifying clearly the preferences to be studied. Recommendations are offered for helping solve these problems.

Driver, B. L., and R. C. Knopf. 1976. Temporary escape: one product of sport fisheries management. Fisheries 1(2):21, 24-29.

Cites data from several studies to support the hypothesis that sport fishing helps people escape from stress experienced in home, neighborhood, and work environments. States that there are strong indications that stress levels within many individuals are increasing and that sport fishing is one way to relieve stress. Feels that more research into the value of sport fishing as a stress-relieving recreational activity is needed to enable managers of sport fisheries to better provide opportunities for this recreational activity.

Dyer, A. Allen. 1969. Recreation site selection: a conceptual approach. 23 p. Inst. Study Outdoor Recreation Tourism, Utah State Univ., Logan, Utah.

Proposes formulating a computerized recreation land model that would incorporate consumer preferences in selecting recreation sites for development. The data base for the model would rest on physical characteristics of the proposed site. Two types of data are needed to operate the model: an assessment of environmental characteristics required for several activities and an inventory of land characteristics pertinent to site quality. Three groups of recreational activities are identified: water based, land based, and winter.

Evans, Eric. 1976. Interview: Verne Huser. Down River, September 1976: 8-9, illus.

Field, D.R. and J.T. O'Leary 1973

Social groups as a basis for assessing participation in selected water activities. Journal of Leisure Research 5:2:17-25.

Field, Donald R and Joseph O'Leary 1973 Social groups as a basis for assessing participation in selected water activities. Journal of Leisure Research 5(2) 16-25

An analytical strategy is proposed in which a social group variable might be employed in conjunction with social aggregate variable of participation in leisure activities

FRISSEL, S.A. and DUNCAN, D.P. (1965) 'Campsite Preference and
Deterioration in the Quetico-Superior Canoe
Country', Journal of Forestry, Vol. 63, pp. 256-60.

USER SURVEY: 33 CANOEISTS
SITE EXAMINATION

WILDERNESS/CAMPING/
CANOEING

This small-scale survey of 33 canoe parties in the Boundary Waters Canoe Area involved fairly straightforward questioning on site preferences and dissatisfactions. Finding sites of the required size, and litter left by previous users were the main problems. Preferences were for island sites, pine cover, flat tent-areas, easily obtainable firewood, good landing areas, and wind protection. Measures were made of loss of vegetation, soil compaction, tree damage, and tree reproduction. Even light use affected these seriously and the article closes with a discussion of possible ways of persuading campers not to over-use sites.

Gaumnitz, Jack E., Robert L. Smith, and John O. Tollefson. 1973. Simulation of water recreation users' decisions. Land Econ. 49(3):269-277.

Assumes that individuals have patterns of behavior that they consistently follow when making decisions about the kinds of recreation facilities to use and types of recreational activities to engage in while at a recreation site. Based on this assumption a simulation model was developed to reproduce the same behavior as an individual when given the same types of choices and decisions to make about the recreational sites. The model was designed with the same mechanisms individuals use to make decisions: memory, memory search, selection procedures, and a set of decision rules. These patterns of behavior can provide managers with a powerful tool to analyze choices and preferences of a population for predicting use rates at water recreation facilities.

Gilbert, C. Gorman. 1972. The use of Markov renewal theory in planning analysis: an application to the Boundary Waters Canoe Area. 154 p. Ph.D. dissertation on file at Dept. Civ. Eng. Northwest. Univ., Evanston, Illinois, June, 1972 (co-advised by G. L. Peterson and Ehren Cinarlar).

Graefe, Alan R. 1977. Elements of motivation and satisfaction in the float trip experience in Big Bend National Park. M.S. thesis. Dep. of Recreation and Parks, Texas A&M Univ., College Station, Texas. 170 p.

Presents results of a study of 329 river floaters on the Rio Grande in Big Bend National Park to determine the inter-relation between motivations and satisfaction in a float trip experience. Describes the most important motivations as: enjoyment, learning about nature, stress release/solitude, intra-group affiliation, challenge/adventure/achievement/photography/autonomy, extra-group affiliation, self-awareness and status. Measures of satisfaction were obtained by comparing importance and performance ratings for each motive. Concludes that Rio Grande float trips are perceived differently by different individuals and are capable of providing a variety of types of float trip experiences.

Grimm, Gary C. Public Right to Access to Public Wild Lands which Approach a Maximum Carrying Capacity University of Oregon Outdoor Program. Eugene Oregon, October 27, 1975.

Abstract: The wilderness is a common public resource designated for recreation, scenic, esthetic, conservation and historic uses.

Special interests such as commercial guide organizations, educational institutions, and social service organizations are seeking special use permits which limit free public access to wilderness. However, these organizations have not yet developed an adequate justification for this special use.

Assuming that first priority is given to the public, land managing agencies are not considering all alternative solutions to wilderness overuse. Nor are they receiving adequate public input regarding the public's need for access to wilderness.

Limiting access to those willing and desirous to meet wilderness on its own terms requires a management attitude which closes overpopulated access trails and roads and which demands independence in wilderness travel.

No citizen has to be denied access to wilderness arbitrarily or by lottery.

Public input processes and behavioral data gathering will provide information regarding the feasibility of this approach to wilderness carrying capacity.

Habermehl, James M. 1973. Determining visitor perceptions of crowding on the Ozark National Scenic Riverways. 53 p. Unpubl. M.S. Thesis on file at Univ. Missouri, Columbia.

Hammon, Gordon A., Harold K. Cordell, Lewis W. Moncrief, M. Roger Warren, Richard A. Crysedale, and John Graham. 1974. Capacity of water-based recreation systems part I: the state of the art--a literature review. Water Resour. Res. Inst. Rep. 90, 49 p. North Carolina State Univ., Raleigh, North Carolina.

Examines the problem of identifying the optimal use-level of recreation for a given water body. Recognizes the complex and dynamic concept of carrying capacity and reviews literature that relates to factors influencing capacity. Discusses applicability of Liebig's law of the minimum to carrying capacity. Reviews empirical research related to capacity conceptualization and measurement. Stresses the need for theoretical models for measuring capacity.

Hammon, Gordon A., Harold K. Cordell, Lewis W. Moncrief, M. Roger Warren, Richard A. Crysedale, and John Graham. 1974. Capacity of water-based recreation systems Part II: a systems approach to capacity analysis. Water Resour. Res. Inst. Rep. 90, 46 p. North Carolina State Univ., Raleigh, North Carolina.

Develops methods, models, and guidelines useful to managers who are interested in measuring or predicting the recreational output of lakes. Presents several explanatory models representing individual and group behavior of pleasure boaters.

Hancock, H. K. 1973. Recreation preference: its relation to user behavior. J. For. 71(6):336-337.

Hansen, E.A. "Does Canoeing Increase Streambank Erosion?" US DI-Forest Service Research Note NC-186.

Describes research to determine if large increases in canoe use on the Pine River in Michigan contribute to accelerated stream bank erosion. Canoeing was not found to contribute to erosion directly, although people sliding down and camping on stream banks were a contributing factor.

Hansen, Edward A. 1975. Does canoeing increase stream bank erosion? USDA For. Serv. Res. Note NC-186, 4 p. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes research on the Pine River in Michigan to determine if large increases in canoeing accelerated stream bank erosion. Most erosion was natural, but people sliding and camping on stream banks created some erosion. Heavy canoe traffic is not a causal factor in erosion.

Hartman, Thomas. Perceptions of a National Park Service manager of whitewater river recreation management.

Heberlein, Thomas A. 1973. Social psychological assumptions of user attitude surveys: the case of the wilderness scale. J. Leisure Res. 5(3):18-33.

Heberlein, Thomas A. 1977. Density, crowding, and satisfaction: sociological studies for determining carrying capacities. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 67-76. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Four types of carrying capacity are identified: physical, ecological, facilities, and social. The importance of both levels of technology and value judgments are noted for determining any of these capacities. The satisfaction model based on an explicit or implicit adoption of economic theory by both researchers and managers for determining social carrying capacity is lacking and an alternative model based on a determination of social norms is proposed. This model is discussed both in terms of recent social psychological studies of crowding as well as prior assessments of recreation carrying capacity. Finally, some practical suggestions for adopting this model are noted.

Heberlein, Thomas A., and Jerry J. Vaske. 1977. Crowding and visitor conflict on the Bois Brule River. Tech. Rep. WIS--WRC-77-04, 100 p. Univ. Wisconsin, Madison, Wisconsin.

Nearly 3,000 canoers, tubers, and fishermen were interviewed as they left the Upper Bois Brule River in the late summer of 1975 to determine their perceptions of crowding, satisfaction, and reported contacts with other visitors. In spite of daily use levels that were as high as 308 visitors on a 10-mile stretch, there was no relation between use levels and satisfaction. This study replicates prior research by Nielson and Shelby on Colorado River visitors, and casts more doubt on an econometric model of carrying capacity based on an assumed relation between use level and satisfaction of river users. All visitor groups expressed similar motivations for their visits, such as being close to nature, but differed in their level of commitment and background.

Hendee, John C., William R. Catton, Jr.,
Larry D. Marlow, and C. Frank Brockman.
1968. Wilderness users in the Pacific
Northwest--their characteristics, values,
and management preferences. USDA For.
Serv. Res. Pap. PNW-61, 92 p. Pac.
Northwest For. & Range Exp. Stn.,
Portland, Oregon.

Holder, Stuart S. "Analysis of Public Water-Based Recreation at Selected Multi-Purpose Lakes and Reservoirs: United States and Northeast Ohio." Kent State University, 1967.

Hooper, R.A. "Background, Recreational Expectations, Perceptions, and Management Preferences of Mountain River Paddlers - A Pilot Study."

Hopkins, Walter S. Jr. "Impacts of Recreation on Competition for Use of Water," Western Resources Conference, 1963. Boulder, Colorado: University of Colorado.

Howard, Gordon, John Bethea, Jr., Dee Kiger, and Rebecca Richardson. 1976. Chattooga River visitor survey. 75 p. Dep. Recreation and Park Administration. Coll. For. and Recreation Resour. Clemson Univ., Clemson, South Carolina.

Study about private and commercial users of the Chattooga River to develop: (1) a demographic profile of on-the-water-users, (2) a profile of water recreation users expectations, (3) a profile on users reactions to management options, and (4) a profile on users perception of river congestion. Study found that there is a difference between commercial and private users and their views toward management options. Commercial users rejected 8 out of 13 but private users rejected 15 out of 21 proposed management options and showed no majority concurrence on the remaining six. This difference may be accounted for partially because commercial users show their willingness to be managed by electing to use a commercial service.

Hunt, John D. Some thoughts on wild river recreation carrying capacity. Logan, Utah: ISORT, Utah St. Univ. 1974. 12 pp. (\$1.00)

Jaakson, R., Buszynski, M.D., Botting, D., "Carrying Capacity and Lake Recreational Planning. A case study from North-Central Saskatchewan, Canada" Town and Planning Review GB (1976) 47, No: 4, 359-373
fig, tabl, cartes bibliogr (31 refs)
Summary from International Geographical bibliography 1977 Vol. 82

James, George A., and Thomas H. Ripley.
1963b. Overuse--a threat to our developed recreation areas. Am. Rec. J.
4(3):5-6.

Jensen, Marvin. Perceptions of a Bureau of Land Management manager of whitewater river recreation management.

Kaplan, R. 1973. Predictors of environmental preference: designers and "clients". In Environmental design research. W. F. E. Preiser, ed. p. 265-274. Dowden, Hutchinson, and Ross, Stroudsburg. Pennsylvania.

Kaplan, R. 1975. Some methods and strategies in the prediction of preference. In Landscape assessment: values, perceptions, and resources. E. H. Zube, R. O. Brush, and J. G. Fabos, eds. p. 118-129. Dowden, Hutchinson, and Ross, Stroudsburg. Pennsylvania.

Kaplan, R. 1976a. Preference and everyday nature: method and application. In Perspectives on environment and behavior. D. Stokols, ed. p. 235-250. Plenum, New York.

1. Kaplan, Rachel. 1977. Down by the riverside: informational factors in waterscape preference. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 285-289. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Suggests that people like rivers and riversides because they provide both a sense of orderliness and a sense of involvement and mystery. The recreation value of rivers extends far beyond fishermen, boaters, and other traditional users. Even unspectacular rivers provide a source of enjoyment and tranquility for many who use only the riverbank, view the river from afar, or who only know that it is "there" and available. Stresses that because these passive users experience benefits similar to active users, their requirements deserve attention in design and management decisions. Suggests that ways must be found to involve passive users in decision-making so their diverse needs and concerns will not be overlooked.

Knopf, R. D. 1972. Motivational determinants of recreational behavior. 268 p. Unpubl. master's thesis on file at Coll. of Nat. Resour., Univ. Michigan, Ann Arbor.

Kaufert, F. H. "Controversy in Canoeland," American Forests, 70 (October, 1964), 24-71.

Knopf, Richard C., B. L. Driver, and John R. Bassett. 1973. Motivations for fishing. In 38th North American wildlife and natural resources Conf. Trans. p. 191-204. March 18-21, 1973. Washington, D.C. Published by Wildlife Management Institute.

Discusses why people fish and engage in other recreation activities. Proposes that recreation management problems should be approached from a behavioral point of view. Identifies important forces that influence how people spend their leisure time and discusses progress in developing techniques for identifying and measuring recreational motives relevant to managers. Illustrates the use of these techniques to learn what motivates select groups of fishermen in Michigan. Concludes that increasing numbers of outdoor recreationists are using natural areas to temporarily resolve problems experienced at home and that serious consideration should be given to the degree to which opportunities should be provided in resolving these problems.

Kinsky, Arthur M. "Determination of Maximum Practical Recreation Use." Unpublished paper presented at U. S. Army Corps of Engineers SPD Recreation Orientation Session, Sacramento, California, November 4-8, 1968.

Kusler, Jon A. 1973. Carrying capacity controls for water recreation uses. Wisconsin Law Rev. 1:1-36.

Defines sociological and ecological carrying capacity and discusses possible methods to limit use: water-surface and shoreline zoning, permits, commercial restrictions, and access controls. Discusses legal considerations of the above controls and cites past litigation regarding riparian versus public rights. Presents a model statute designed to strengthen water and shoreland planning in Wisconsin.

Lewis, Darrell E., and Gary G. Marsh. 1977. Problems resulting from the increased recreational use of rivers in the West. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 27-31. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Discusses impacts and conflicts created by increasing recreational use of rivers in the western United States. Problems addressed include environmental, social, and administrative interrelations on rivers.

Levin, J. 1977. Some dimensions of river preference. 104 p. Master's thesis. School Nat. Resour. Univ. Michigan.

Leonard, R. E. 1976. Design capacity: a possible approach to some backcountry management problems. Appalachia 42(2):20-21.

Lesko, G.L., Robinson, G.B. Impact and Management recommendations for primitive campgrounds in the Junshire Egypt Lake Areas, Banff National Park, Northern Forest Research Center 1975 86p Documentation Center 25th Floor HC0070.C2 LS6

Lime, D.W. A Pilot Survey for a Study to Determine User Attitudes and Perceptions of Crowding in the Boundary Waters Canoe Area. U.S. Dept. of Agriculture Back-County Travel, Visitor Perception, Natural Ecosystem Values 1969 U.S. Department of Agriculture North Central Forest Research Station St. Paul, Minnesota

Lime, David W., and George H. Stankey. 1971. Carrying capacity: maintaining outdoor recreation quality. In Forest Recreation Symp. Proc. p. 174-184. Northeast For. Exp. Stn., Upper Darby, Pennsylvania.

Discusses (a) what is meant by the concept of recreational carrying capacity, (b) what is known about capacities in terms of both how resources and experiences of visitors are affected by recreational use, and (c) what alternative procedures the administrator can use to manage both resources and visitors for capacity.

Lime, D.W. (1970) 'Research for Determining Use Capacities of the Boundary Waters Canoe Area', Naturalist, Vol. 21, No. 4 (Winter), pp. 9-13.

DISCUSSION

WILDERNESS CAMPING CANOEING

Article identifies 'problem areas', 'research areas' and management issues. Problem areas are divided into resources and people problems. Resource area requires identification of ecologically acceptable use levels for water quality, wildlife, vegetation, etc. On the 'people' side perception of crowding, perception of the resource, selection behaviour and reactions to management need to be studied to determine acceptable use levels. Management then has to decide which criterion sets the lowest use level for different locations and seasons, and plan for this. Much of the research work of Lime and Lucas is geared to this scheme.

Lime, D.W. 1975. "Sources of Congestion and Visitor Dissatisfaction in the Boundary Waters Canoe Area," Proc. of the Third Boundary Waters Canoe Area Institute.

Preliminary findings from an on-going programme by the author to study social carrying capacity in the BWCA. Paper summarizes findings concerning visitor attitudes and perceptions of crowding. Includes proposal for management actions to off-set visitor dissatisfaction from widespread congestion.

Lime, David W. 1975. Sources of congestion and visitor dissatisfaction in the Boundary Waters Canoe Area. In Quetico-Superior Foundation 1975 Institute on the Boundary Waters Canoe Area Proc. p. 68-82. May 9, 1975, Duluth, Minnesota. Quetico-Superior Foundation, Minneapolis, Minnesota.

Summarizes trends in visitor use since the advent of the Wilderness Permit in 1966. Also reviews a 1971 study of visitor attitudes and perceptions of crowding. Concludes that shifts in use suggest a greater significance of the Boundary Waters Canoe Area as a national wilderness resource. Discusses several management actions to reduce crowding.

Lime, David W. 1976. Principles of recreational carrying capacity. p. 122-134. In Southern States Recreation Research Applications Workshop Proc., USDA For. Serv. Gen. Tech. Rep. SE-9, p. 122-134. Southeast. For. Exp. Stn., Asheville, North Carolina.

Lime, David W. Physical resource and social determinants of whitewater river recreation and some implications of these conditions for visitor management.

Litton, R. Burton, Jr. 1974. Visual vulnerability of forest landscapes. J. For. 72(7):392-397.

LUCAS, ROBERT C.
1963 Visitor reaction to timber harvesting in the Boundary Waters Canoe Area. Lake States For. Exp. Sta., St. Paul, Minn. USDA For. Serv. Res. Note LS-2, 2p.

"About two-thirds of the Boundary Waters Canoe Area is available for logging under certain restrictions. This brief note explores the extent to which visitors were aware of logging and how many were bothered by seeing it." (Stankey and Lime, 1973).

Lucas, R.C. (1963) The Quetico-Superior Area: Recreational Use in Relation to Capacity, Ph.D. dissertation, University of Minnesota

Lucas, R. C. 1964. Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area, Natural Resources Journal, 3(1):394-411.

This is one of the classic studies on wilderness and recreation. Is one of the first attempts to uncover the perception of wilderness by different groups of users. The author found that the boundaries of wilderness are extremely flexible and are by no means limited to map boundaries.

LUCAS, ROBERT C.

- 1964a The recreational capacity of the Quetico-Superior area. Lake States For. Exp. Sta., St. Paul, Minn. USDA For. Serv. Res. Pap. LS-15, 34p., illus.

More people visit the Quetico-Superior wilderness each year, raising the question of recreational capacity. The factors limiting capacity are discussed with emphasis on visitors' perception of the recreational resources of the area. Data is presented on the importance of the wilderness and other qualities to various user groups; the area considered wilderness; and the characteristics of the wilderness. Wilderness qualities were the main attraction for canoe trippers; other visitors considered fishing or scenery primary. Canoeists saw the wilderness as smaller than other visitors. Canoeists also felt the wilderness was overcrowded at lower levels of use, and objected strongly to motor boats. A suggested method for estimating the wilderness capacity of the Quetico-Superior indicates total use is close to capacity, but more area is underused than over used. Use projections point to severe over use. Management implications discussed include zoning, dispersal of canoeists, better flow of information and the eventual limitation of numbers of visitors.

LUCAS, ROBERT C., AND GEORGE B. PRIDDLE

- 1964b Environmental perception: a comparison of two wilderness areas. Abst. in Ann. Amer. Assoc. Geogr. 54 (Sept.): 428-429.

"The concept of resources as cultural perceptions seems essential in the study of recreational resources - especially for the study of wilderness. The perception of the environment by recreational visitors to two similar wilderness lakelands, the Quetico-Superior Area on the Minnesota-Ontario border and Algonquin Provincial Park north of Toronto, proved quite parallel.

"Variation in wilderness perception was associated with several factors, but in different ways for different types of recreationists. People who came for canoe trips considered the wilderness aspects of the areas to be the major attraction. They perceived the wilderness as smaller than the officially established area, with a northward orientation, and they excluded roads, heavy canoeing use, and even light boating use. Limited logging away from lakeside zones did not detract appreciably from the canoeists' wilderness in the Quetico-Superior, but it did in Algonquin where cutting was more widespread. The other visitors (fishermen, etc.) considered wilderness qualities secondary to fishing and scenery. They perceived a large area as wild, including areas with low-standard roads, substantial boat and canoe use, and logging.

"Recreational use of wilderness areas is increasing rapidly. This poses a dilemma: the more use, the less wilderness. Our findings confirm the reality of this dilemma but suggest some partial solutions, mainly through dispersing users (now highly concentrated) and separating incompatible uses.

Lucas, Robert C., and George H. Stankey. 1974. Social carrying capacity for backcountry recreation. p. 14-23. In Outdoor recreation research: applying the results. Paper from a workshop held by the USDA Forest Service at Marquette, Michigan, June 19-21. USDA For. Serv. Gen. Tech. Rep. NC-9, 113 p., illus. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Lucas, Robert C. 1970. User evaluation of campgrounds on two Michigan national forests. USDA For. Serv. Res. Pap. NC-44, 15 p. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Campground use on the Huron and Manistee National Forests was studied in relation to resource characteristics, location, facilities provided, and visitor attitudes about the environment. Applies regression analysis to explain variation in campground use per unit. Compares visitor ratings of quality to nationwide Forest Service recreation resource inventories.

Merriam, L. C., Jr., and C. K. Smith. 1974. Visitor impact on newly developed campsites in the Boundary Waters Canoe Area. J. For. 72(10):627-630.

The impact of visitor use on newly developed campsites tended to level off after the first 2 years. Visitor registration provided nearly complete use data, and the effects on soil, water quality, vegetation, and site size were measured and mapped. Physical measurements were combined into an impact-stage rating system by cover types. Management implications of the results are discussed.

MERRIAM, L.C., JR., C.K. SMITH, D.E. MILLER, CHING TIAO HUANG,
J.C. TAPPEINER, II, KENT GOE VERMANN, J.A. BLOEMENDAL, AND
T.M. COSTELLO

1973 Newly developed campsites in the Boundary Waters
Canoe Area - a study of 5 years' use. Agr. Exp. Sta.
Bull. 511, Forestry Series 14, Univ. Minnesota, 27p.,
illus.

33 wilderness campsites (developed in 1967 by the Forest Service) in the BWCA were studied for 5 years (1968-1972) to determine impact of visitor use. 23 sites had no previous use. During the study, the effects on soils, vegetation, and site size were measured and mapped twice each year. Photographs were taken periodically from permanent points. At selected sites, detailed soil and water quality data were also collected. Through visitor registration, nearly complete use data were obtained for the 23 locations. Visitors completed cards and questionnaires on site selection, appearance, and on their satisfaction with the sites. Results indicate the combination of impact changes (stage) tends to level off and that many of these changes come in the first 2 years. Apparently, most sites in key locations, where there are few alternative campsite choices, could be kept open. This assumes that soil conditions are not irreversible and that water pollution is not critical. Exceptions would be closed aspen-birch sites. Campsites with popular characteristics (rocky lodges, part open, etc.) could be hardened for continued use. To rotate them with closed canopy sites, particularly in aspen-birch stands, would seem self-defeating because more and more area would be opened to use due to a longer recovery time than impact time.

MCCOOL, STEPHEN F., AND LAWRENCE C. MERRIAM, JR.

1970 Travel method preferences of BWCA campers. Minn. For.
Res. Note 219, 4p. Sch. For., Univ. Minn., St. Paul.

"Probes the extent to which paddling canoeists and motor boaters are satisfied with their method of travel. Examines the reactions of people toward other travel methods and discusses future patterns of use and management implications." (Stankey and Lime, 1973).

McCool, Stephen F., and Lawrence C. Merriam, Jr. 1970. Travel method preferences of BWCA campers. Minnesota For. Res. Note 219, 4 p. Sch. For., Univ. Minnesota, St. Paul, Minnesota.

Probes the extent to which canoeists and motor boaters are satisfied with their method of travel. Examines the reactions of people toward other travel methods and discusses future patterns of use and management implications.

McCOOL, S.F.

1970

Dynamics of interpersonal interaction in the forest environment: an exploration of outfitter-camper relationships in the Boundary Waters Canoe Area. Unpubl. Ph.D. dissertation, Univ. Minnesota.

McCOOL, STEPHEN F., AND LAWRENCE C. MERRIAM, JR.

1970

Factors associated with littering behavior in the Boundary Waters Canoe Area. Min. For. Res. Note 218, 4p. Sch. For., Univ. Minn., St. Paul.

This study found that the closer the interaction between individuals - and the more visible their acts, the more likely they were to comply with anti-littering regulations. "Local" residents were less sensitive to the litter problem and complied less with litter regulations than did visitors from far away. Compliance with anti-littering regulations is related to occupation: operatives and craftsmen are more likely to litter than are managers, professionals and students. Persons who interacted extensively with outfitters and/or were members of organized groups were less likely to litter than those who interacted less. Examines the need for managers to establish relationships with non-outfitted groups in order to gain compliance.

McCool, Stephen F., and Lawrence C. Merriam, Jr. 1970. Factors associated with littering in the Boundary Waters Canoe Area. Minnesota For. Res. Note 218, 4 p. Sch. For., Univ. Minnesota, St. Paul, Minnesota.

Defines those variables most meaningfully related to sensitivity about litter and compliance with littering regulations. Discusses the role of outfitters in communicating and reinforcing norms. Examines the need for managers to establish relations with nonoutfitted groups in order to gain compliance.

MINNESOTA ENVIRONMENTAL QUALITY BOARD.

1978. VISUAL SENSITIVITY OF RIVER RECREATION TO POWER PLANTS
78 P. MINNESOTA ENVIRONMENTAL QUALITY BOARD, ST. PAUL,
MINNESOTA.

PRESENTS A METHODOLOGY FOR ASSESSING THE VISUAL IMPACT OF POWER PLANTS ON RIVER RECREATION NEEDS, WHICH WILL ALLOW COMPARISONS OF POWER PLANT LOCATIONS RELATIVE TO RIVER RECREATION. PROCEEDS ON 2 PARALLEL TRACKS: 1) LANDSCAPE CHARACTER TRACK- DETERMINES THE VISUAL ABSORPTION POTENTIAL OF VARIOUS LANDSCAPES FROM THE ASSESSMENT OF POWER PLANT AND RIVER-RELATED LANDSCAPE CHARACTERISTICS, 2) RECREATION POTENTIAL TRACK- ASSESSES RECREATIONAL ACTIVITIES, THEIR SENSITIVITY TO VISUAL INTRUSION AND THEIR RELATIVE IMPORTANCE. USES THE RIVERS METHOD TO ASSESS THE RECREATION POTENTIAL FOR A RIVER.

MOELLER, G.H. and ENGELKEN, J.H. (1972) 'What Fishermen Look For in a Fishing Experience', Journal of Wildlife Management, Vol. 36, No. 4, (Oct.) pp. 1253-7.

INTERVIEW SURVEY
OF 100 FISHERMEN

ATTITUDE
CHECKLISTS

FISHING

Respondents were asked to rate the following as very important, important or not important: water quality, natural beauty, privacy, size of fish, weather, number of fish, access and facilities. The scores for each of these factors (v. important = 3, important = 2, and not important = 1) were analysed against respondents' age, fishing experience, willingness to pay, average leisure time per week, educational level and rural or urban residence. The order of importance of the factors (in the order listed above) was almost precisely the same from all groups. It is suggested that the findings point towards the inclusion of 'environmental management' in the concept of 'fishery management'.

Murphy, Peter. "The Role of Attitude in the Choice Decisions of Recreational Boaters" Journal of Leisure Research 1975 Vol. 7 #3 p 216-224

Nash, Roderick. 1973. Wilderness and the American mind. 300 p. Yale Univ. Press.

Nash, Roderick. Changing conceptions of the meaning and purpose of protected wildland: Implications for river management.

New York State Canal Recreation Development Program. 1975. Joint report of Parks and Recreation and Department of Transportation, State of New York. 105 p. Parks and Recreation, Albany, New York.

O'RIORDAN, TIMOTHY PAGET, GREGG.
1978. SHARING RIVERS AND CANALS, A STUDY OF THE VIEWS OF COARSE ANGLERS AND BOAT USERS ON SELECTED WATERWAYS. SPORTS COUNCIL STUDY 16, 44 P. THE SPORTS COUNCIL, LONDON, ENGLAND.

REPORTS THE FINDINGS OF A 1976 STUDY TO DETERMINE THE NATURE OF THE INTERACTION BETWEEN ANGLERS AND BOAT USERS ON 4 REPRESENTATIVE LINEAR WATERWAYS IN ENGLAND AND THE WELSH BORDER. INFORMATION IS REPORTED FOR 3 RIVERS ON THE EXTENT OF CONTACT BETWEEN THE 2 GROUPS, HOW THEY FELT ABOUT IT GIVEN PATTERNS OF MOTIVATIONS AND EXPECTATIONS HELD, AND WHAT SOLUTIONS THEY OFFERED IF IT WAS SEEN AS A PROBLEM. INCLUDES AN APPENDIX ON A SURVEY CONDUCTED TO DETERMINE THE EFFECTIVENESS OF A VOLUNTARY TIME ZONING AGREEMENT ON 2 RIVERS IN THE NORFOLK BROADS.

Parkes, J.G.H. (1973) Public Perceptions of Water Quality and their Effect on Water-based Recreation, Social Science Series No. 8, Ottawa: Inland Waters Directorate, Water Planning and Management Branch, Environment Canada. pp. 53

1,100 SITE INTERVIEWS	ATTITUDE STATEMENTS/	WATER QUALITY
AT 3 LAKE AND COASTAL	CHECKLISTS	WATER SPORTS
SITES	REGRESSION	

Recreationists (swimming, fishing, hiking, water-skiing, boating, and picnicking) were interviewed at beach-sites in Nova Scotia, Quebec and Saskatchewan. In addition to background data respondents were asked to rate the area as a recreation spot (from excellent to very poor), they were asked to describe the main advantages and disadvantages of the area and to rank the area with other cities visited. An open-ended question was asked about water-quality at the time of interviews and then whether water-quality problems reduced their visit rate. A series of questions about the effect of pollution on particular activities is followed by questions on improvements desired, willingness to pay more and whether they intended to return. Respondents were then asked how they would distribute 100 dollars between Housing, Education, etc. and Recreation lakes. Respondents then self-completed a form containing the attitude statements concerning pollution. The results are only briefly reported in tabulated form. It is concluded that users are aware of pollution and that varying levels of pollution affects use. Most users would be prepared to pay for improved water quality. The study also includes a scientific examination of water quality at each site.

Peckfelder, Robert L. 1973. Wild river perception and management: a study of users and managers of the Middle Fork of the Salmon River. Scenic Rivers Study Rep. 8, 108 p. Water Resour. Inst., Univ. Idaho, Moscow, Idaho.

During the summer float season of 1971, questionnaires were administered about the perceptions river managers have concerning the characteristics and attitudes of river floaters and the perceptions, attitudes, and characteristics river floaters have about themselves and river management. Data analysis show that Middle Fork River managers are in tune with floaters on their personal outlook of river management but have a poor idea of floaters' personal characteristics. Significantly more floaters than managers felt solitude should be an important part of the river experience.

Peterson, George L., and Edward S. Neumann. 1969. Modeling and predicting human response to the visual recreation environment. J. Leisure Res. 1(3):219-237.

A method to predict user preferences for the visual recreation environment is proposed. Quantitative preference functions that respond sensitively to individual differences and characteristics of the environment are developed.

Peterson, G. L., and G. Gilbert. 1971.
"Application of Markov Renewal Theory to
Travel Behaviour in the Boundary Waters Canoe Area,"
presented to I.E.E.E. Fall Electronics Conference,
Chicago, October 18 - 20.

Paper suggests a conceptual and mathematical strategy for modelling
camp migration and provides a good discussion of the problems
involved in operationalizing the model. Purpose of the travel
behaviour model is to provide managers with the ability to
predict the impact of alternative controls and camp migration
and, consequently, intensity of use.

PETERSON, G.L. (1971) Motivations, Perceptions, Satisfactions and
Environmental Dispositions of Boundary Waters
Canoe Area Users. Evanston, Illinois: North-
Western University, pp. 205.

SURVEY OF
200 USERS
AND MANAGERS
ON-SITE AND POSTAL

ATTITUDE STATEMENTS, SCALES

CAMPING
CANOEING

The aim of the study was 'to explore the application of
elementary techniques of psychological measurement and statistics
toward quantitative analysis'. Extensive lists (running
to over 100 items) were put to respondents, of reasons why people
might visit the area. They were asked to indicate the importance
of the factors on a nine-point scale. The same lists were then
presented and opinions sought on their own experience in the
area. The 'relative congruity' between the ideal and the
actual experience is then examined. 'In general it is reaffirmed
by this study that the average B.W.C.A. user wants more
perception of wilderness and less hardship, discomfort and
inconvenience'.

Peterson, G. L., and D. W. Lime. 1973. "Two Sources
of Bias in the Measurement of Human Response to the
Wilderness Environment," Journal of Leisure Research.
5 (Spring). pp. 66 - 73.

The Study considers two potential sources of bias in the measure-
ment of attitudes, preferences, and perceptions of wilderness
visitors: (1) situational bias; and (2) voluntary response bias.
The source of such bias was explored by means of an experimental
design allowing them to be observed in terms of a spectrum of
wilderness experience. The study was conducted in the Boundary
Waters Canoe Area.

Peterson, D. J. 1974. A Comparison of the Sentiments and Perceptions of Wilderness Managers and Canoeists in the BWCA, Journal of Leisure Research, 6(3):194-206.

The study was conducted to determine whether canoeists and wilderness managers differed in their wilderness motivations, attitudes, preferences, and perceptions. A detailed spectrum of the "wilderness experience" was obtained by employing psychological inventories, specifically McKechnie's Environmental Response Inventory. A number of differences showed up between the two groups both in terms of environmental disposition and human response to the wilderness experience. One of the more significant studies of this type.

Peterson, George L., James S. deBettencourt, and Pai Kang Wang. 1977. A Markov-based linear programming model of travel in the Boundary Waters Canoe Area. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 342-350. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes and illustrates a Markov-based linear programming method used for predicting and analyzing travel in Minnesota's Boundary Waters Canoe Area so management can control the rate of entry of travellers into the Area.

Pfister, Robert E., and Robert E. Frenkel. 1975. The concept of carrying capacity: its application for management of Oregon's scenic waterway system. Rogue River Study Rep. 2, 50 p. Oregon State Marine Board and Water Resour. Res. Inst., Oregon State Univ., Corvallis, Oregon.

Increased recreational use of rivers has led to the examination of the carrying capacity concept and its management application as a basis to determine appropriate levels of seasonal use on Oregon's rivers. Proposes a set of principles based on the idea that an operational approach to carrying capacity is important in decision-making. States that although river management plans are not mandatory to implement the carrying capacity concept, they provide for a positive approach to river management.

Pfister, Robert E. 1977. Campsite choice behavior in the river setting: a pilot study on the Rogue River, Oregon. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 351-358. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The relation of campsite choice to the natural characteristics of campsites was analyzed along the Rogue River in Oregon. Two regression models--for commercial and noncommercial camping parties--were formulated relating campsite choice to 13 site characteristics of river terraces. Of the five significant variables selected for each model, three were the same: size of the campsite, size of the tributary providing potable water to the location, and a rating of beach area available for landing a boat.

Priddle, G. B. 1964. Wilderness Perception in the Algonquin Park Interior, unpublished M.A. Thesis. Clark University, Graduate School of Geography.

PRIDDLE, GEORGE B., CAMERON D. CLARK, AND LARRY O. DOUGLAS
1973 Factors affecting the quality of interior recreation in Algonquin Provincial Park. Ont. Dep. Lands Forests, Toronto. Res. Pap.

"Users were interviewed during their trip to determine the degree of satisfaction they received while using particular segments of well-known canoe routes. The basic output of this 'Canoe Network Analysis' are criteria that can be used to determine, in perceptual or attitudinal terms, the carrying capacity of a particular section of the park, taking into consideration the quality of the lakes, the number of potentially good campsites, and the number of people that can be accommodated before a 'crowded' situation would be experienced." (Stankey and Lime, 1973).

Rabinowitz, C. B., and R. E. Coughlin.
1970. Analysis of landscape characteristics relevant to preference. Reg. Sci. Res. Inst. Discuss. Pap. 38.
86 p. Philadelphia, Pennsylvania.

Ready, K.F. (1973) Perceptions by Area Residents of the Recreational Potential of the Merrimack River: A Spatial Analysis, Master's Thesis, Miami University

Roggenbuck, Joseph W. Methodological issues involved in the development of attitude scales for assessing the carrying capacity of white-water.

Roggenbuck, Joseph W. 1975. Socio-psychological inputs into carrying capacity assessments for float-trip use of whitewater rivers in Dinosaur National Monument. 309 p. Ph.D. diss. Dep. For. and Outdoor Recreation, Utah State Univ., Logan, Utah.

Examines potential management strategies, perceptions of crowding, and sources of satisfaction for river users on the Green and Yampa Rivers in 1975. Different identifiable user groups varied in their responses to questions concerning recreational use of whitewater rivers as a function of differing expectations for the recreational experience.

Roggenbuck, Joseph W., and Richard M. Schreyer. 1977. Relations between river trip motives and perception of crowding, management preference, and experience satisfaction. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 359-364. North Cent. For. Exp. Stn., St. Paul, Minnesota.

River-floaters in Dinosaur National Monument were interviewed during the summer of 1975. Trip motives, in descending order of importance to users, were: action/excitement, learning about nature, stress release/solitude, affiliation, autonomy/achievement, self-awareness, and status. User scores on the motive-scales were related to user perceptions of river crowding, opinions on appropriate maximum group-size, campsite development strategies, river management techniques, and user satisfaction. A number of correlations were statistically significant, though relations tended to be weak. Management implications are also discussed.

Rogue River Group

1974 The Wild and Scenic Rogue: How Many People Are Too Many? An Enquiry Into Recreational Use of the River and the Trail Between Grave Creek and Watson Creek. Unpublished worksheet distributed at public hearing held in Portland, Grants Pass, and Gold Beach, Oregon in July and August.

Scheyer, R. and L. Royer. 1975. "A Proposal to Analyze and Interpret User Perception of the Colorado River in Canyonlands National Park and the Green and Yampa Rivers in Dinosaur National Monument." (submitted to U.S. National Park Service Cooperative Research Unit).

Contains a proposal to analyze and interpret user perception of the recreation carrying capacity on the Green and Yampa Rivers. Presents good conceptual basis for utilization of user surveys.

Scheyer, R. 1976. "Behavioural Research on Whitewater Rivers." (unpub.).

Discusses need for data on current behavioural patterns of river users, and identification of reaction to alternate management strategies. Suggestion is forwarded that this can be determined through generating information concerning the social and psychological factors which influence users' recreational expectations. Provides a questionnaire given to river users in the Dinosaur National Monument.

Schreyer, Richard. 1976. Behavioral research on whitewater rivers. Utah Tourism and Recreation Rev. 5(1):1-5.

Discusses the development of a behavioral information data-bank to aid recreation managers who are responsible for whitewater rivers. Behavioral information needed about users is: (1) who are they, (2) where do they come from (mentally and geographically), and (3) what do they want? This information would: (1) identify the kinds of experiences users want, (2) allow managers to receive direct feedback on special actions, and (3) help managers "to see" the people using the resource instead of just using "visitor days" and "camper nights" to describe them.

Schreyer, Richard, Joseph W. Roggenbuck, Stephen F. McCool, Lawrence C. Royer, and Jay Miller. 1976. The Dinosaur whitewater river recreation study. 165 p. Institute for the Study of Outdoor Recreation and Tourism Dep. For. and Outdoor Recreation. Utah State Univ., Logan, Utah.

Reports the results of a 1975 study of users of the Green and Yampa Rivers in Dinosaur National Monument. Users were predominantly first time floaters and were overwhelmingly satisfied with the trip. Their most important expectations for the trip were found to be action/excitement, experiencing nature, and stress release/solitude. Recommends action managers can take to satisfy users but still minimize the effects of crowding and maintain a quality experience.

Scheyer, R., S. F. McCool, M. Nielson, and D. Pinney. 1976. "Study Plan: A Study of the Characteristics and Attitudes of River Recreationists on two Rivers Administered by the Bureau of Land Management." Institute for the Study of Outdoor Recreation and Tourism, Utah State University. 29p.

Contains a proposal for a study to generate information which will assist administrators in the Bureau of Land Management to make effective decisions concerning the management of whitewater rivers. The study will be carried out on the Green River through Desolation Gray Canyons and the Colorado River through Westwater Canyon. The proposed questionnaire is included in the submission. The format is a refinement of that contained in Scheyer (1976) (see: C - 2).

Schreyer, Richard. 1977. Satisfaction and user input to management. Utah Tourism and Recreation Rev. 6(1):1-7.

Proposes that the effectiveness of management decisions may be assessed by analyzing user input and scientific data. Defines recreation behavior and its main factors--past experience, expectations, and satisfaction. States that it is possible to associate recreational opportunities (canoeing, river running) with specific experiences (solitude, excitement) and that it is possible to manage for the experiences. Also includes results from a 1975 study on the Green and Yampa Rivers in Dinosaur National Park on recreation behavior and rivers.

Schreyer, Richard, and Joseph W. Roggenbuck.
Strategies for the assessment of social-
psychological carrying capacities of
whitewater rivers--A comparative analysis.
Paper presented at the First National
Conference on Scientific Research in the
Parks, New Orleans, LA. Nov. 1976. (Free)

SCHREYER, RICHARD, ROGGENBUCK, JOSEPH
1973. THE INFLUENCE OF EXPERIENCE EXPECTATIONS ON CROWDING
PERCEPTIONS AND SOCIAL-PSYCHOLOGICAL CARRYING CAPACITIES.
LEISURE SCIENCES 1(4):373-393.

PROPOSES THAT PERCEPTIONS OF CROWDING ARE A FUNCTION OF THE
DIFFERING EXPECTATIONS PEOPLE MAY HAVE FOR GIVEN RECREATION
EXPERIENCES. A STUDY OF WHITEWATER RIVER RECREATIONISTS IN
DINOSAUR NATIONAL MONUMENT SHOWED THAT PERSONS WHO SCORE
MORE HIGHLY IN CERTAIN EXPERIENCE EXPECTATIONS ARE MORE
SENSITIVE TO CROWDING, THAT DIFFERENT EXPECTATIONS SHOW
VARYING SENSITIVITIES TO CROWDING AND THAT VARIOUS USER
GROUPS DIFFER SIGNIFICANTLY IN THE RATED IMPORTANCE OF THESE
EXPECTATIONS. ALSO EMPLOYS A WILDERNESS ATTITUDE SCALE.
DISCUSSES IMPLICATIONS FOR THE ASSESSMENT OF RECREATION
CARRYING CAPACITY.

SCHREYER, RICHARD, NIELSON, MARTIN L.
1978. WESTWATER AND DESOLATION CANYONS: WHITEWATER RIVER
RECREATION STUDY.
196 P. INSTITUTE FOR THE STUDY OF OUTDOOR RECREATION AND
TOURISM, DEP. FOR. AND OUTDOOR RECREATION, COLL. NAT.
RESOUR., UTAH STATE UNIV., LOGAN, UTAH.

REPORTS THE RESULTS OF A DETAILED VISITOR SURVEY OF
WHITEWATER RECREATION IN WESTWATER CANYON ON THE COLORADO
RIVER AND DESOLATION/GRAY CANYONS ON THE GREEN RIVER IN
UTAH. THE RESEARCH WAS DESIGNED TO PROVIDE INSIGHTS INTO THE
NATURE OF RIVER RECREATION IN GENERAL, NOT TO PROVIDE A
SPECIFIC MANAGEMENT TOOL. THE RESULTS ARE DIVIDED INTO 7
SECTIONS: (1) DECISION FACTORS IN RIVER RUNNING, (2) RIVER
TRIP CHARACTERISTICS, (3) USER PREFERENCES OF MANAGEMENT
OBJECTIVES, (4) PERCEPTIONS OF OTHERS, (5) ATTITUDES TOWARD
MANAGEMENT, (6) DEMOGRAPHICS OF RIVER USERS, AND
(7) EXPECTATIONS OF RIVER USERS. IN SECTIONS 1-6 THERE ARE
MULTIPLE ANALYSES OF THE DATA FOR SPECIFIC SUBSETS OF THE
USER POPULATION.

Schmidly, David J., and Robert B. Ditton. 1976. A survey and analysis of recreational and livestock impacts on the riparian zone of the Rio Grande in Big Bend National Park. 160 p. Dep. of Wildl. and Fish. Sci. and Dep. of Recreation and Parks. Texas A&M Univ., College Station, Texas.

Reports the results of a study conducted on the Rio Grande in Big Bend National Park. Study was organized into four parts: (1) visitor usage analysis; (2) subjective site evaluation; (3) biotic communities analysis; and (4) photographic recordings. Based on information uncovered in the study, recommendations are made for establishing a management framework. Various management strategies are also presented.

Settergren, Carl D. 1977. Impacts of river recreation use on streambank soils and vegetation--state-of-the-knowledge. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 55-59. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Various means of assessing recreational impacts on stream-side soils and vegetation have been employed to provide data to support and implement management decisions. Believes that past research in this area has usually been confounded by several problems. Suggests that the most critical research needs are: (1) selecting sampling points or sites to yield impact data representing an entire riverway; (2) randomly locating plots, points, and transects within a selected area; (3) locating suitable before-and-after or used-and-unused sites for control; (4) selecting and measuring the most important and most user-sensitive soil and vegetation features; and (5) measuring visitor use and how it correlates with impact data.

SHAFFER, E.L. Jr., HAMILTON, J.E. Jr., and SCHMIDT, E.A. (1969)
'Natural Landscape Preferences: A Predictive Model',
Journal of Leisure Research, Vol. 1, No. 1 (Winter)
pp. 1-20.

INTERVIEWS WITH
550 CAMPERS

PHOTOGRAPHS

LANDSCAPE

100 black and white photographs were divided into the following zones: A. Sky, B. Immediate vegetation (leaves, etc. can be distinguished), C. Intermediate vegetation (individual trees can be distinguished), D. Distant vegetation

Shafer, Elwood L., Jr., John F. Hamilton, Jr., and Elizabeth A. Schmidt. 1969.
Natural landscape preferences: a predictive model. J. Leisure Res. 1(1):1-19.

People visiting the Adirondack's of New York State were interviewed during the summer of 1967 to identify significant quantitative variables in photographs that relate to public preferences for landscapes. Using factor analysis and multiple regression techniques, an equation was developed that accounts for the majority of variation in preference scores of landscape photos. Both the applicability of the model to resource planning and management and its limitations are discussed. Method has possible application for identifying riverscape characteristics preferred by recreation users.

Shelby, B. 1975b. Sociological carrying capacity of wild areas. Paper presented at the Annual Meeting of the Rural Sociological Society, San Francisco. California.

Shelby, Bo. 1975. Social-psychological effects of motorized travel in wild areas: the case of river trips in the Grand Canyon. 66 p. Human Ecol. Res. Serv., Inc., Boulder, Colorado.

Reports results of two studies to evaluate potential motor/oar conflicts on the Colorado River through Grand Canyon National Park, Arizona: a pilot study in 1974 and a field study in 1975. Data from visitors traveling both by motor and oar power indicated that trip experiences differ on a number of characteristics including participant's background, opinions about motorized watercraft, number of encounters with other parties, and camping styles. Combination motor and oar powered trips were developed to observe same group behaviour in both situations and to identify individuals preferences for one type of trip or the other. Flouters on combined motor and oar powered trips expressed a preference for the oar trip.

Shelby, B., and J. M. Nielsen. 1975a.
Use levels and user satisfaction in
the Grand Canyon. Human Ecol. Res.
Serv., Inc., Boulder, Colorado. p. 36.

Shelby, Byron B. 1976. Social psychological effects of crowding in wilderness; the case of river trips in the Grand Canyon. Ph.D. diss. Dep. Sociol., Univ. Colorado, Boulder, Colorado. 180 p.

The effects of different use levels on crowding are discussed based on data collected on river trips in the Grand Canyon. The carrying capacity model traditionally applied to wilderness recreation is outlined, and then compared to a more general crowding model derived from research in other areas. Use levels have a pervasive effect on intergroup contacts, which in many ways define the "character" of the river experience. However, neither use levels nor contacts affect perception of crowding, and none of these variables affect passengers overall rating of the trip.

Shelby, Bo, and Joyce McCarl Nielsen. 1976. Use levels and crowding in the Grand Canyon. River Contract Study Final Rep. Part III, 51 p. Human Ecol. Res. Serv., Inc., Boulder, Colorado.

Use levels affect the character of the river experience. Most river travelers define the Canyon and their trip as wilderness, and most perceive the Canyon as uncrowded. However, perception of crowding is independent of actual contact levels, and user satisfaction is unrelated to either perceived crowding or number of encounters. The lack of relation among these variables is attributed to the lack of agreement about how crowded the Canyon should be. Trip satisfaction was based on personal benefits, social atmosphere, and wilderness character the trip provided. Suggests that effective management of crowding should emphasize controlling the character of the river experience.

SOUTH CAROLINA DEPARTMENT OF PARKS, RECREATION AND TOURISM
AND WILDLIFE AND MARINE RESOURCES DEPARTMENT.
1978. SOUTH CAROLINA RIVER TRAILS STUDY.
93 P. COLUMBIA, SOUTH CAROLINA.

Stankey, G. H. 1971. The perception of wilderness carrying capacity: a geographic study in natural resources management. 351 p. Unpubl. Ph.D. diss. on file at Michigan State Univ. Library, East Lansing, Michigan.

Stankey, George H. 1973. Visitor Perception of Recreation Carrying Capacity. Ogden, Utah: U.S.D.A. Forest Service Intermountain Forest and Range Experiment Station.

Stankey, G. H. and D. W. Lime. 1973. Recreational Carrying Capacity: An Annotated Bibliography, General Technical Report INT-3. USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah.

This annotated bibliography includes over 200 citations covering both ecological and social dimensions of the capacity problem. The contents are as follows: (1) concept of carrying capacity, (2) biological investigations, (3) esthetic carrying capacity, (4) managing for carrying capacity, and (5) author index. Note that the bibliography covers up to 1973.

Stankey, George H. 1974. Criteria for the determination of recreational carrying capacity in the Colorado River Basin. *In* Environmental management in the Colorado River Basin. p. 82-101. A. Berry Crawford and Dean F. Peterson, eds. Utah State Univ. Press, Logan, Utah.

States that the Colorado River Basin offers a variety of recreational opportunities and, as such, can satisfy a wide range of user preferences and needs. All agencies responsible for managing and planning recreational use in the Basin and the public must be involved in determining the recreational carrying capacity of the Basin. Not only will their concerted efforts enhance existing opportunities but they will also open the door for new recreational pursuits. Presently the recreational planning efforts of various agencies have been isolated from each other, and the goals and objectives of these efforts frequently reflect the agencies biases.

Stankey, George H., Robert C. Lucas, and David W. Lime. 1974. Patterns of wilderness use as related to congestion and solitude. p. 17. Paper presented at annual meeting of Assoc. of Am. Geographers, Seattle, Washington.

Stephans, Eleanor Belknap. "Conflicts in Recreation." Unpublished Master's Thesis, University of North Carolina, Chapel Hill, North Carolina, 1962.

Sutton, Steven W. The impact of floaters on the Ozark National Scenic Riverways. 152 p. Unpubl. Master's Thesis on file at Sch. For., Fish., and Wildl., Univ. Missouri, Columbia.

Tarbet, Don, George H. Moeller, and Keven T. McLoughlin. 1977. Attitudes of Salmon River users toward management of Wild and Scenic Rivers. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 365-371. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Salmon River floaters were asked to answer a questionnaire that solicited their attitudes toward wilderness river recreation experiences and management. Factors relating to health and physical fitness, adventure, awareness of nature, communion with nature, and wilderness preservation were viewed favorably by nearly all respondents. Intensive management practices such as developed campsites, gravel roads and trails, picnic tables, garbage cans, and allowing power boats were rejected by almost all respondents.

TAYLOR, M.C.
1970

An investigation of crowding levels and perception among canoeists in Algonquin Park. Unpubl. M.A. thesis, Dep. Geog., Univ. Western Ont., London.

Threinen, C. W. "An Analysis of Space Demands for Water and Shore." Reprinted from Transactions of the 29th North American Wildlife and Natural Resources Conference, March 9-11, 1964. Washington, D.C.: Wildlife Management Institute, 1964, pp. 353-372.

USDI - Bureau of Land Management. n.d. "River Environmental Analysis Record." 13 p.

Paper contains list of anticipated impacts from increased river use and recommendations for permit system to assist in mitigating impacts. Provides example of information and stipulations which are given to river users. Discussion is generally superficial.

U.S. DEPARTMENT OF THE INTERIOR

1967 Outdoor recreation space standards. 67p. Wash., D.C.: Gov. Print. Off.

This publication compiles recreation area and facility space standards currently being used by many organizations throughout the U.S. Includes standards for trip canoeing and rivers, extended hiking trips and hiking trails. Includes a bibliography of 135 sources.

Utter, (Jack G.) Wilderness and Wild River Carrying Capacity Management
A proposed Case Study of Use Permit Allocation on the Middlefork
of the Salmon River. Views Review Company Moscow Idaho 1976

Bureau of Outdoor Recreation, Department of Interior. 1968.
"Recreation & Aesthetics." Appendix F. Development of Water
Resources in Appalachia. Washington, D.C.: U.S. Government
Printing Office, 1968.

Wagar, J.A. 1978. "Recreational Carrying Capacity."
Proc. of the Wildland Recreation Conference.
Banff, Alberta.

Warbler, Donald S., and Alan Jubenville. 1975. Perceptions and management preferences of users as a result of the commercial floating experience on the Snake River within Grand Teton National Park, 1975. 34 p. Dep. Recreation and Park Admin. Univ. Wyoming. Laramie, Wyoming.

Describes results of a study on individuals participating in commercial float trips on the Snake River in Grand Teton National Park. Regression analyses were used to identify independent variables that affect user satisfaction (seeing other rafts, man-made developments, interpretive talks, wildlife, etc.). Visitor satisfaction was high with respect to natural scenery, interpretive talks, wildlife, floating scenic waters, and relaxing on the trip. Seeing other rafts and crowding were somewhat neutral. Seeing man-made developments was a negative factor.

Warren, Sam E. 1977. How to ration river floating use: the Middle Fork of the Salmon experience. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 151-154. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes efforts by the Forest Service to limit float-trip use since 1972 on the Middle Fork of the Salmon River, Idaho. Notes the problems of finding equitable means of allocating permits between commercial and noncommercial parties and dealing with people without reservations.

Wehunt, Eugene P., Jr. 1971. Landowner's perception of recreationist associated conflicts in the Salmon-Little River corridor of Idaho. 104 p. Unpubl. M.A. Thesis on file at Univ. Idaho, Moscow.

West, Neil E. An ecologists thoughts toward determining the recreational carrying capacity of whitewater sections of the Upper Colorado River Drainage.

Wohlwill, (Joachim F.), Harry Heft. "A Comparative Study of User Attitudes towards Development and Facilities in 2 contrasting Natural Recreation Areas" Journal of Leisure Research 1977. Vol. 9 #4 p. 264-280

E. RECREATION MANAGEMENT AND RESEARCH METHODS

Badger, Daniel D. "Recreational Considerations in Water Planning," Proceedings of the 10th Annual Conference on Water for Texas. College Station, Texas: Water Resources Institute, Texas A & M University, November 22-23, 1965, pp. 43-48.

Baker, W. M. 1964. An approach to pilot projects in 1964 under the recreational sector of the Canada land inventory. 55 p. Toronto.

J. Belisle et al, An Analysis of Texas Waterways (Texas Parks and Wildlife Dept.) Nov. 1974. Texas Parks and Wildlife Dept., Comprehensive Planning Branch, John H. Reagan Bldg., Austin, Texas 78701. Copy in ARC Branch.

Bester, Ronald, and Terry Daniel. 1973. Measuring public response to vegetative management...forests, land use, environmental quality. p. 38-43. In 16th Annu. Arizona Watershed Symp. Proc.

Branch, James R., and Stephen C. Fay. 1977. Recreation management planning for a multi-use scenic river corridor. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-26, p. 142-146. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Thirteen Mile Woods is a highly scenic strip of forest land along the northern reaches of the Androscoggin River in New Hampshire. A survey of its visitors--canoeists, kayakers, picnickers, campers, fishermen, and snowmobilers--indicated their desire to maintain the area in its undeveloped condition. Land capability and administrative viewpoints indicated the same minimum development. Design capacity is discussed as a management concept for this land and river corridor.

Brockman, Frank C. 1961. Recreation and water in the west. In Water Resources papers 1960: water-measuring and meeting future requirements. Harold L. Amos, ed. Univ. Colorado, Boulder, Colorado.

Outlines the history of increasing interest in public recreation lands in the United States. Notes that conflicts in priorities arise, especially in the western States, between recreation and consumptive uses. Stresses the need for recreation planning that will balance such conflicts and will maximize inherent benefits of wildlands. Cites current research that will facilitate such planning: ecological studies, carrying capacity research, and human behavior studies.

Brown, Perry J. 1977. Information needs for river recreation planning and management. In River recreation management and research Symp. Proc., January 24-27, 1977. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 193-201. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Information inputs to making decisions about recreational use of rivers are described. Major recreational decisions and possible inputs to them are identified. A future scenario for recreational use of rivers is given and the needed research on information inputs is identified within the context of the scenario.

BURCH, W.R. Jr., (1964) 'Two Concepts for Guiding Recreation Management Decisions', Journal of Forestry, Vol. 62, Oct., pp. 707-12.

ON-SITE INTERVIEWS
WITH 287 CAMPING
GROUPS. PLUS OBSERVATION

CAMPING
GENERAL

Cieslinski, Tom. 1976. Plan implementation-
Allagash river. p. 78-84 In Northeast.
Reg. States Scenic Rivers Planning
Workshop Proc., May 25-27, Harrisburg,
Pennsylvania.

Clark, Roger N. 1976. How to control
litter in recreation areas: The incen-
tive system. USDA For. Serv. 10 p.,
illus. Pac. Northwest For. & Range
Exp. Stn., Portland. Oregon.

Clark, Roger N. 1977. Alternative strategies for studying river recreationists.
In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech.
Rep. NC-28, p. 91-100. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Recreation researchers have a variety of social research tools available to them. Often, however, the application of alternative tools in studying recreation issues is inconsistent with the strengths and weaknesses of the procedures. Alternative research strategies are discussed in terms of their ability to provide information to answer basic questions about recreation users and recreation problems. Implications for planners, managers, and policy-makers are addressed.

Couch, Robert E. "Attitudes of Decision Makers Towards Development of an Urban River Park" Dept. of Recreation and Parks, Texas A & M University 1974

Craig, William S. 1977. Reducing impacts from river recreation users. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 155-162. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Dramatic increases in river recreation use make it mandatory for managers to utilize the latest knowledge for preventing site degradation and maintaining a desired experience. Suggests that such innovative management as scheduling use, hardening sites, and improving human waste disposal, can make it possible for a Wild and Scenic River Area to support more people without lowering the visitor's experience or the environmental quality.

Craighead, Frank C., Jr. 1965. Semi-wild rivers--the Upper Snake, a river in transition. Naturalist 16(3):6-17.

Settlements and developments along the Snake River have harnessed large sections of the river for hydroelectric energy. Impoundments and dykes have likewise altered its channel and stream flow. Rivers are dynamic and they often change in subtle ways, such as the type of recreation use and users and the man-made structures along rivers. Scientific, informed approaches are needed to classify, evaluate, and manage rivers. Outdoor recreation experiences are influenced by both the uniqueness of the water resource and the quality of recreational experiences. Steps to integrate river recreation management into public planning for an entire river basin are suggested.

Frenkel, R.E. and R.E. Pfister. 1975. The Concept of Carrying Capacity: Its Application for Management of Oregon's Scenic Waterway System. University of Oregon (Rogue River Study - Report 2).

GOETZ, HANK.
1977. A COOPERATIVE APPROACH TO RIVER MANAGEMENT: THE BLACKFOOT EXPERIENCE.
WESTERN WILDLANDS 4(2): 32-37.

DESCRIBES THE PROBLEMS BETWEEN LANDOWNERS AND RECREATIONISTS ASSOCIATED WITH INCREASING RECREATIONAL USE OF THE BLACKFOOT RIVER IN MONTANA AND THE DEVELOPMENT OF A SOLUTION THROUGH AD-HOC LOCAL PLANNING. THE COOPERATIVE RECREATIONAL MANAGEMENT PLAN DEVISED IS EVALUATED SATISFACTORILY AND OFFERED AS AN APPROACH TO THE MANAGEMENT OF OTHER RIVERS WITH LARGE PROPORTIONS OF PRIVATE RIPARIAN OWNERSHIP.

Gray, John. 1969. "An Approach to Design and Planning for Outdoor Recreation: Two Case Studies in Water-Oriented Recreation Areas." Unpublished M.A. Thesis. Berkeley, California: University of California, College of Environmental Design.

HIGGINS, JOSEPH F.
1977. A VISITOR DISTRIBUTION PROGRAM FOR THE BOUNDARY WATERS CANOE AREA.
NATURALIST 28(4): 23-29.

DISCUSSES THE FIRST 2 YEARS OF THE VISITOR DISTRIBUTION PROGRAM FOR THE BOUNDARY WATERS CANOE AREA WHICH WAS DESIGNED TO REDISTRIBUTE USE BOTH THROUGHOUT THE AREA AND THROUGHOUT THE USE SEASON. REVIEWS THE ENTRY POINT QUOTAS FOR OVERNIGHT CAMPERS AND THE RESERVATION SYSTEMS USED. EVALUATES THE SUCCESS OF THE PROGRAM AND RELATES A PROBLEM OF SEVERE COMPETITION FOR THE MOST POPULAR ENTRY POINTS IN THE SECOND YEAR. DISCUSSES THE ATTEMPTS TO SOLVE THE PROBLEM AND THE RESULTING NEW LONG TERM RESERVATION SYSTEM THROUGH THE RANGER STATIONS.

Huser, Verne. 1977. Industry responds to the explosion in river recreation. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 38-44. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes the response of private enterprise to the growing interest in river recreation-- (1) increase in the number of outfitters, (2) increase in watercraft and gear production, (3) increase in the literature about the sport, and (4) increase in number of services that are provided the river-using public.

HYRA, RONALD.

1978. METHODS OF ASSESSING INSTREAM FLOWS FOR RECREATION. INSTREAM FLOW INFORMATION PAPER 6, 16 P. + APPEND. USDI, FISH AND WILDL. SERV., COOPERATIVE INSTREAM FLOW SERVICE GROUP, FORT COLLINS, COLORADO.

DESCRIBES 2 TECHNIQUES DEVELOPED FOR PERFORMING RECREATION INSTREAM FLOW STUDIES. A SIMPLER CROSS SECTION METHOD PROVIDES A MINIMUM FLOW RECOMMENDATION FOR BOATING ACTIVITIES MAKING USE OF THE RIVER. A MORE SOPHISTICATED INCREMENTAL METHOD MAY BE USED TO DEVELOP RECOMMENDATIONS REGARDING STREAM FLOWS REQUIRED FOR VARIOUS TYPES OF RECREATION OR TO PROVIDE A RECREATIONAL ANALYSIS OF ANY STREAM FLOW. PROVIDES STREAM FLOW SUITABILITY CRITERIA FOR DIFFERENT ACTIVITIES FOR BOTH METHODS.

IRVINE, RUSSELL, AND GARY SEALEY

1971 A bibliography of selected topics related to park and recreation planning and management. 187p., 29 chapters. Ontario Dep. Lands and Forests, Parks and Recreation Areas Br., Div. Outd. Recreation. Toronto, Ontario.

Most relevant chapters include: "Beach and Lake Management"; "Carrying Capacity"; "Interpretation"; "Nature Trails and Centres"; "Park and Recreation Systems Planning"; "Wildland Management"; and, "Wildlife Management". This bibliography is annotated.

Jaakson, Reiner. "Planning for the Capacity of Lakes to Accommodate Water Orientated Recreation." Plan Canada, Vol. 10, No. 3, 1970, pp. 29-40.

JAMES, GEORGE A.

n.d. Bibliography on recreation use sampling techniques. Southeastern For. Exp. Sta., Asheville, N. Carolina. USDA For. Serv. Rec. Res. Proj.

1973 An annotated bibliography of selected references relating to physical and biological recreation site management. 17p. (mimeo.). Southeastern For. Exp. Sta., Asheville, N. Carolina. USDA For. Serv. Rec. Res. Proj.

Johnson, W.A. and R.A. Hooper. River Recreation Management Concepts: A Summary of Current Practices.

Knetsch, Jack L. 1974. Outdoor recreation and water resources planning. Water Resour. Monogr. 3, 121 p. Am. Geophys. Union, Washington, D.C.

Summarizes advances in existing techniques to quantitatively determine the demand for recreational opportunities and to estimate the value of such opportunities. Previous attempts to quantify recreational demand used projection models based on population, average income, and distance traveled to recreation sites. Some ways to estimate recreational values have been the market value method, cost method, willingness to pay, and gross expenditures method.

Kusler, J. A. Regulation to Reduce Conflicts Between Recreation Water Uses. Research Report 65. Madison, Wisconsin: Dept. of Natural Resources, 1970.

Lime, David W. 1975. Backcountry river recreation: problems and research opportunities. Naturalist 26(1):2-6, 16-17.

Identifies increasing use of backcountry rivers and the associated social and environmental problems. Urges sociological research on three topics: (1) how patterns of river use and characteristics of users vary within and between rivers; (2) how current and potential users define a high-quality river recreation experience; and (3) kinds of management-techniques needed to increase user enjoyment and decrease resource damage.

Lime, D. W. 1976. "Problem Analysis: Limited Knowledge of Recreation Use and Use-Management of Backcountry River Resources." North Central Forest Experiment Station.

Unedited draft copy not for general circulation. Reviews topics related to river recreation requiring further investigation.

LIME, DAVID W., LUCAS, ROBERT C.
1977. GOOD INFORMATION IMPROVES THE WILDERNESS EXPERIENCE.
NATURALIST 28(4): 18-21.

PRESENTS THE RESULTS OF AN EFFORT BY THE SUPERIOR NATIONAL FOREST IN NORTHERN MINNESOTA TO USE INFORMATION AS A VISITOR MANAGEMENT TECHNIQUE. A BROCHURE DESCRIBING PAST USE OF THE BOUNDARY WATERS CANOE AREA WAS SENT TO A PORTION OF THE PREVIOUS YEAR'S VISITORS BEFORE THE USE SEASON. FOLLOWING THE USE SEASON, QUESTIONNAIRES WERE SENT TO A SAMPLE OF THOSE RECEIVING THE BROCHURE TO EVALUATE ITS EFFECTIVENESS IN REDISTRIBUTING USE. RESPONSES INDICATE THAT THE INFORMATION DID INFLUENCE USERS TO AVOID CROWDED AREAS AND PEAK USE PERIODS. CONCLUDES THAT INFORMATION SUPPLIED TO VISITORS WELL IN ADVANCE OF THE USE SEASON CAN BE AN EFFECTIVE TOOL IN REDISTRIBUTING WILDERNESS USE.

Lime, David W. 1977. Research for river recreation planning and management. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 202-209. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Three research problem-areas emphasizing social or people problems on rivers are described: (1) how patterns of river recreation use and characteristics of users vary on individual rivers, between different rivers, and with time; (2) how current and potential users define quality river recreation experiences; and (3) how patterns of river recreation use can be modified.

Lime, David W. "Managing Visitor Use on Whitewater Rivers. 1979. 4 pages. Available from Parks Canada, Socio-Economic Research Division, Document Centre.

LIME, DAVID W.
1977. WHEN THE WILDERNESS GETS CROWDED . . . ?
NATURALIST 28(4): 1-7.

SUMMARIZES TRENDS IN THE USE OF THE BOUNDARY WATERS CANOE AREA IN NORTHERN MINNESOTA SINCE THE ADVENT OF THE WILDERNESS PERMIT IN 1966. ALSO GIVES SOME RESULTS OF RECENT STUDIES FOCUSING ON VISITOR ATTITUDES AND PERCEPTIONS. DISCUSSES MANAGEMENT ALTERNATIVES TO OFFSET THE WIDESPREAD CONGESTION AND GENERAL LOSS OF SOLITUDE FELT BY MANY VISITORS. DISCUSSES THE CONFLICT BETWEEN MOTORIZED AND NON-MOTORIZED TRAVEL THAT IS PREVALENT IN SOME PARTS OF THE BWCA.

Lucas, R. C. 1965. User Concepts of Wilderness and Their Implications for Resource Management, in New Horizons for Resources Research: Issues and Methodology. Western Resources Paper 1964:29-39. Boulder: University of Colorado Press.

Lucas, R. C. 1974. Forest Service Wilderness Research in the Rockies: What We've Learned So Far, Western Wildlands, Spring: Vol. 1, No. 2, pp. 5-13.

Author feels growing use is the heart of the management problem. Research thus far has been either ecological or social. A few studies are footnoted relating to each of the two areas. The article concludes with an emphasis on the need for a broader spectrum of wilderness opportunities to cover a range user demands. A very general, informal discussion.

Lucas, R. C. and M. Schecter. 1977. Recreational Visitor Travel Simular Model as an Aid to Management Planning, Simulation and Games, 8:375-384, Spring.

This is a brief, general overview of the applications for simulation models in the management of wilderness areas. It describes four main components to the models: (1) route networks; (2) user characteristics; (3) user-route interactions; and (4) user-user interactions.

Magill, Arthur W. 1976a. Campsite reservation systems. Trends (April-May-June):16-19, illus.

Magill, Arthur W. 1976b. Campsite reservation systems--the campers' viewpoint. USDA For. Serv. Res. Pap. PSW-121. [In press.] Pac. Southwest For. & Range Exp. Stn., Berkeley, California.

Mak, Kenneth R., Marvin O. Jensen, and Thomas L. Hartman. 1977. Management response to growing pressures in western white-water rivers--the art of the possible. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 102-109. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes agency responses to the increasing demand for whitewater recreation, development of management plans, and why planning and public involvement are needed. An example of conflicting interests and resulting political pressure is given.

MCCOOL, STEPHEN F., LAWRENCE C. MERRIAM, JR., AND CHARLES T. CUSHWA 402
1969 The condition of wilderness campsites in the Boundary Waters Canoe Area. Minn. For. Res. Note 202, 4p. Sch. For., Univ. Minn., St. Paul.

"Reports on a study to determine the physical condition of campsites within the Boundary Waters Canoe Area and to help in the selection of future sites. Measurements were taken of various physical parameters at over 100 sites. Results for island and mainland sites and onroute versus offroute locations are given."

McCool, S.F., L.E. Royer, J.J. Kennedy, and J.D. Hunt, 1974. "Recreational Use and Management Problems on Utah's Wild Rivers," Proc. of the Utah Academy of Sciences, Arts and Letters. 51(1): 109-115.

Excellent paper providing a model for the determination of recreational carrying capacity limits on wild rivers. Model relies heavily upon a definition of legislatively derived management objectives. Factors considered include: resource characteristics; management objectives; and the visitor's perceptual definition of expected experiences.

McCool, S.F., 1975. "Selecting a White Water Management Strategy," Proc. White Water River Carrying Capacity Symposium.

The utility of three approaches to the definition of management strategies are evaluated - space inventories, ecological impact studies, and social-attitude studies. Weakness in each approach are outlined and a basis for making the concept of acceptable limits of change is forwarded. Procedure is based on surveys of users whose values are compatible with institutionalized resource definitions.

McCool, Stephen F. and David W. Line. The wilderness area travel simulator: Applications to river recreation management. Paper presented at the Interagency White-water Management Conference, Salt Lake City, Utah. Feb. 1976. 16 pp. (\$1.00)

THIS PAPER, PRESENTED ON 11 FEBRUARY 1976 AT THE INTERAGENCY WHITEWATER MANAGEMENT CONFERENCE HELD IN SALT LAKE CITY, UTAH, DESCRIBES A MODEL FOR PREDICTING CONGESTION LEVELS AND ENCOUNTER FREQUENCIES IN WILDERNESS TRAVEL. INPUT REQUIRED INCLUDES NUMBER OF GROUPS, GROUP SIZE AND TYPE BY ACCESS POINT, DAY OF THE WEEK, AND TIME OF DAY; AVERAGE TRAVEL TIME FOR EACH TRIP SEGMENT; AND AVERAGE DURATION AT STOPPING POINTS. THE MODEL WAS ADAPTED FOR RIVER RECREATION MANAGEMENT, AND APPLIED IN A STUDY OF RECREATIONAL FLOAT BOATING ON THE GREEN AND YAMPA RIVERS IN DINOSAUR NATIONAL MONUMENT. THE EFFECTS OF 3 ALTERNATIVE POLICIES ON AVERAGE NUMBER OF ENCOUNTERS, PROBABILITY OF CAMPING NEAR OTHER GROUPS, AND OCCUPANCY RATE AT JONE'S HOLE CAMPGROUND WERE EXAMINED. EQUALIZING DAILY ENTRANCE RATES PRODUCED A SLIGHT INCREASE IN ENCOUNTER RATES AND A GREAT INCREASE IN OCCUPANCY AT JONE'S HOLE. REPLACEMENT OF PRIMITIVE CAMPS BY 2 DEVELOPED ONES SLIGHTLY INCREASED ENCOUNTERS, GREATLY REDUCED JONE'S HOLE OCCUPANCY, AND DID NOT AFFECT THE PROBABILITY OF CAMPING NEAR OTHER GROUPS. INCREASING FLOATER USE BY 25 PER CENT INCREASED ENCOUNTER RATES BY A SIMILAR FRACTION, INCREASED JONE'S HOLE OCCUPANCY TO NEAR MAXIMUM, AND HAD ONLY MODERATE IMPACT ON THE PROBABILITY OF CAMPING NEAR OTHER GROUPS.

McCool, Stephen F. Strategies and techniques for managing dispersed recreation in national parks. Visitor Capacity Conference, Southwest Region Superintendents Conf. National Park Service. Ft. Worth. IX April 1976. 32 pp. (\$1.50)

McCool, Stephen F., David W. Lime, and Dorothy H. Anderson. 1977. Simulation modeling as a tool for managing river recreation. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 304-311. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Accelerating use of free-flowing rivers for recreational floating has led many managers to set visitor use limits. The Wilderness Area Simulation Model was modified to predict patterns of river recreation use occurring under a variety of use conditions and was tested on the Green and Yampa Rivers in Dinosaur National Monument for the week of June 23-29, 1975. The "Base Case" simulation and actual patterns of use were compared and were found to be in close agreement. A variety of experiments, such as changing daily entry rates and opening and closing campgrounds, were simulated.

NEW YORK STATE PARKS AND RECREATION AND NEW YORK STATE
DEPARTMENT OF TRANSPORTATION.
1975. NEW YORK STATE CANAL RECREATION DEVELOPMENT PROGRAM.
104 P. NEW YORK STATE PARKS AND RECREATION, NEW YORK.

DESCRIBES THE NEW YORK STATE CANAL RECREATION DEVELOPMENT PROGRAM IN WHICH AN INTERCONNECTED STATEWIDE SYSTEM OF CANAL PARKS AND TRAILWAYS WILL BE DEVELOPED USING THE EXISTING AND ABANDONED CANAL SYSTEM. DISCUSSES POLICIES, POTENTIAL RECREATION ACTIVITIES, AND DEVELOPMENT AND OPERATION PLANS. PROVIDES A GUIDE TO ALL THE PROPOSED AND EXISTING PARK AND TRAIL PROJECTS ALONG THE CANAL SYSTEM.

Nielsen, Joyce McCarl, and Bo Shelby. 1977. River-running in the Grand Canyon: how much and what kind of use. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 178-182. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Management issues relating to amount and kind of river-running use on the Colorado River in the Grand Canyon were investigated in 1975. Results show that use levels affect number of inter-group contacts, but number of contacts has little effect on perceived crowding or user satisfaction. Describes probable effects of an increase in car trips.

Parent, C. R. Michael, and Franklin E. Robeson. 1977. Effects of National Park Service and Forest Service regulations on concession operations. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 334-341. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Examines the impact of USDA Forest Service and National Park Service regulations on the market structure of commercial float trip companies under their respective jurisdictions. Discusses price and quantity aspects of demand and differences in regulations.

PETERSON, GEORGE L
1977. THE COMPUTER TAKES A CANOE TRIP.
NATURALIST 28(4): 9-11.

DISCUSSES THE DEVELOPMENT OF A COMPUTER MODEL OF THE TRAVEL PROCESS IN THE BOUNDARY WATERS CANOE AREA AND QUETICO PROVINCIAL PARK. DESCRIBES HOW THE MODEL IS USED BY MANAGERS AS A POLICY-PLANNING TOOL TO DEVELOP ENTRY POINT QUOTAS FOR THE VISITOR DISTRIBUTION SYSTEMS OF THESE AREAS. ALSO DESCRIBES HOW WILDERNESS TRAVEL IN THESE AREAS IS CONTROLLED BY A METHOD OF DAILY ENTRY POINT QUOTAS.

Romesburg, H. Charles. 1974. Scheduling models for wilderness recreation. *J. Environ. Manage.* 4(2):159-177.

Scheduling recreation in wilderness areas is explored through mathematical modeling. A river system for recreational float trips is used as a hypothetical example.

Royer, Lawrence E., Wm. H. Becker, and Richard Schreyer, eds. 1977. Managing Colorado River whitewater--the carrying capacity strategy. *Inst. for the Study of Outdoor Recreation and Tourism, Dep. For. and Outdoor Recreation, Utah State Univ., Logan, Utah.*

Includes papers by managers and researchers on the issue of carrying capacity of whitewater rivers in the canyon country of Utah. Includes articles on the concept and meaning of protected wildlands, the physical resource and social determinants of whitewater recreation, and social inputs to carrying capacity decisions.

Schafer, Thomas G. 1975. Management alternatives for the improvement of canoeing opportunities and the resolution of problems relating to the recreational use of rivers. Ohio Dep. Nat. Resour. Tech. Rep. 5, 181 p. Off. Plann. Res., Columbus, Ohio.

A three-phase study was conducted during 1974 in an effort to evaluate the needs and problems associated with canoeing in Ohio. The first phase was to gather information about other States' canoe programs to serve as a source of data on manager's viewpoints of how river recreation use and users should be managed. Phase two was to survey 1,000 Ohio canoe owners to identify their attitudes about management alternatives to problems of increased canoe use on Ohio's rivers. The final phase was to review and analyze phases one and two. Results of phase three identified the following alternatives to control use on the State's rivers: institute a permit system, increase the number of facilities and access points along some rivers, provide more campsites along rivers, and publish a "Guide to Ohio's Canoe Trails".

Schreyer, Richard. Sociological and political factors in carrying capacity decision making. Visitor Capacity Conference, Southwest Region Superintendents Conf. National Park Service, Ft. Worth, TX. April 1976. (\$1.00)

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and Tourism
UMC 52
Utah State University
Logan, Utah 84322

For further information about the Institute,
its members, or current research, feel free to
call 801-752-4100, ext. 7954, or write:

SCHREYER, RICHARD.
1977. RESTRICTING RECREATIONAL USE OF WILDLANDS: LESSONS
FROM WHITEWATER RIVERS.
WESTERN WILDLANDS 4(2): 45-52.

WHITEWATER RIVER RECREATION MANAGEMENT IS USED AS AN EXAMPLE
OF USE RESTRICTIONS IN RESPONSE TO CROWDING PROBLEMS IN
WILDLAND RECREATION. REVIEWS THE PROBLEMS AND SUCCESSES OF
RECREATIONAL USE RESTRICTIONS ON WHITEWATER RIVERS AND THE
DIFFERENCES BETWEEN USE LIMITATION STRATEGIES IN RIVER AND
TERRESTRIAL SITUATIONS. CONCLUDES THAT WILDLAND RECREATION
USE REGULATION IS NECESSARY TO PRESERVE EXPERIENCES AS
DEMANDS INCREASE.

SOLOMAN, MICHAEL J., AND EDWARD A. HANSEN

1972 Canoeist suggestions for streams management in the
Manistee Natural Forest of Michigan. North Central
For. Exp. Sta., St. Paul, Minn. USDA For. Serv.
Res. Pap. NC-77, 10p., illus.

Discusses canoeist use of and opinions concerning management of the Pine River in Michigan. Users enjoyed the rapids and the wild, natural shoreline appearance and objected to littering and crowding. The present level of weekend and holiday use apparently satisfies the diversified desires of most canoeists. However, reduction of numbers or more even distribution during the day would increase the quality of experience and lessen the resource impact. Canoeists requested modest additional facilities but expressed little concern about severely eroding streambanks and a dam they had to portage around. Clear management implications include: (1) a plan to keep the stream environment "natural"; (2) implementation of a litter reduction program involving provision of more refuse containers, a requirement that all material carried in the canoe be either secured or floatable, and a banning of cans, bottles, and other non-burnable containers. Management options dealing with regulation of canoe numbers presents a problem because of conflicts between user groups such as fishermen vs. canoeists or canoeists out for a group outing vs. canoeists seeking solitude; and because an optimum level of use must be established first, in relation to the quality of the environment.

Stankey, G. H. and J. Braden. 1977. Rationing Wilderness Use: Methods Problems, and Guidelines. USDA Forest Service Research Paper INT-192. Intermountain Forest and Range Exp. Station, Ogden, Utah.

The paper suggests that wilderness managers can regulate ecological and social impacts by implementing one or more of five basic rationing systems. The author reviews reservations, fees, queing, lottery, and merit systems and points out the advantages and disadvantages of each. Guidelines for managers to help minimize the effects of "regimentation" are also discussed.

Tadros, M. and R. J. Kalter. 1971. "Spatial Allocation Model for Projected Water Based Recreation Demand." Water Resources Research, 7: 798-811.

Terry, Claude E. 1977. Citizen groups: their role in river recreational planning. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 210-213. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Suggests that the two equal and essential components that the river recreation planner must consider in decision-making are the managed space and the user who will inhabit that space. Believes use conflicts arise as the result of territorial interests of citizen groups. Notes that although the conflict between specific recreation users can never be fully resolved, the resource manager can adopt certain attitudes and actions to mitigate the conflict.

Texas Parks and Wildlife Department. Texas Waterways:
A feasibility report on a system of wild scenic
and recreational waterways in Texas. 40 p.
November, 1973. ARC Branch, 22nd floor.

Texas Parks and Wildlife Department. Pathways and
Paddleways: A trail and scenic waterways
feasibility. Texas Parks and Wildlife Department.
Austin, Texas 78701. ARC library.

USDA Forest Service. 1977. River recreation management and research. USDA For.
Serv. Gen. Tech. Rep. NC-28, 455 p., illus. North Central For. Exp. Stn., St. Paul, MN.

North Central Forest Experiment Station, Back country River Recreation
Management Research Project: Symposium, River Recreation Management and
Research January 24-27, 1977 Minneapolis Minnesota

USDI. Manual for Management of Wild and Scenic Rivers (Draft)
43 CFR 6223 0-3(a)

United States Department of Agriculture. Forest
Service. National River Recreation Study.
1979. Available from: North Central Forest
Experiment Station, 1992 Folwell Avenue, St.
Paul, Minnesota 55108.

This questionnaire is being used as a tool to
further river recreation management research
at the North Central Forest Experiment
Station.

U.S. Department of the Army. Corps of Engineers. 1970. "Procedures
for Estimating Recreation Use." ER 1120-2-403. Washington,
D.C., March 1970.

UTTER, JACK.
1977. ALLOCATING USE ON BACKCOUNTRY RIVERS: SOME LEGAL
ISSUES.
WESTERN WILDLANDS 4(2): 53-58.

CONSIDERS THE LEGAL ISSUES THAT MAY BE ASSOCIATED WITH USE
ALLOCATION ON BACKCOUNTRY RECREATIONAL RIVERS. THE BASIC
AUTHORITY OF LAND MANAGEMENT AGENCIES IS DISCUSSED AND 3
LEGAL TOPICS THAT AFFECT THE AUTHORITY OF AN AGENCY TO
MANAGE AND ALLOCATE RIVER USE ARE REVIEWED:
(1) NAVIGABILITY, (2) PUBLIC RIGHTS DOCTRINE, AND
(3) FEDERAL PUBLIC RIGHTS.

Virginia's Outdoors Plan 1974. Virginia Commission of Outdoor Recreation. Trails, Byways, Scenic Rivers. 1974. 803 E. Broad Street, Richmond, VA. \$5.00.

Wang, Pai Kang. 1976. Travel behavior and management control in the BWCA. 168 p. Ph.D. diss., Dept. Civ. Eng., Northwest. Univ., Evanston, Illinois.

Wang, P. K., G. L. Peterson, and J. de Bettencourt. 1976. "A Markov - Based Linear Programming Model of Travel in the Boundary Waters Canoe Area." Department of Civil Engineering, Northwestern Univeristy.

Paper describes and illustrates a Markov - based linear - Programming method for predicting and analyzing travel in the Boundary Waters Canoe Area. The management problem the method deals with is controlling the rate of entry of travellers into the wilderness through various entry locations so as to avoid unacceptable congestion in the interior. A mathematical description of the travel model is provided. The management problem is explained and application of the model to the problem is discussed.

"Development Planning for Water Resources," Robert D. Dean and Carolyn Wilson, Division of Urban and Regional Studies, Memphis State University, December 1970. 69.

WILSON, FERGUS.
1977. QUETICO PROVINCIAL PARK.
NATURALIST 28(4): 12-15.

DISCUSSES THE VISITOR DISTRIBUTION PROGRAM IMPLEMENTED IN QUETICO PROVINCIAL PARK OF ONTARIO, CANADA IN 1977.
EVALUATES THE EFFECTIVENESS OF THE PROGRAM IN IMPROVING VISITOR DISTRIBUTION BY CONTROLS ON WILDERNESS USE LEVELS AND USER ACTIVITIES.

1969 A state trail study. 57p. (mimeo.) Madison,
Wis.: Dep. Nat. Resour.

This report first discusses general trail concepts. Next an inventory of trails over five miles in length is reviewed and the present and future demand for various trail types is discussed. Categories of trails defined include: hiking trails, nature trails, wilderness trails, canoe trails, horse trails, biking trails, snowmobile trails and ski trails. Any single trail classification may have a multiple use designation. General thoughts on trail development and certain technical data related to the development and maintenance of trails are presented. Potential long multiple use trail corridors are suggested for further research. Several recommendations are made relating to the development of trails in Wisconsin.

Wojno, J. A. 1973. Sojourn time distributions in a Markov renewal model of travel behavior: an application to the Boundary Waters Canoe Area. 75 p. M.S. thesis, Dept. Civ. Eng. Northwest Univ., Evanston, Illinois.

F. LAND ACQUISITION AND CONTROL

Allen, Paul, and Kathy Pollard. 1974.
Conservation easements. p. 24. The
Maryland Environmental Trust, Baltimore,
Maryland.

Alston, Farnum, and Bob Deer. 1975. The Wolf River--an uncertain future. Naturalist
26(1):12-15, 18.

Details the history of Menominee Indian's management practices and use of the Wolf River
in northeastern Wisconsin. Discusses land tenure changes, State leasing of land for
public access and use, and current conflicts over inclusion of Wolf River in the National
Wild and Scenic River System.

Ames, Peter. New techniques to Preserve Areas of Scenic Attraction in
Established Rural - Residential Communities - The Lake George Approach.
in Syrause Law Review, 11p. 1966, DINA Library.

How to Save Your River: A Citizen's Guide to Water Projects. Available
from ARCC for \$1.00.

Canada-Ontario-Rideau-Trent-Severn Water-
way (CORTS). 1975. Report of the
Coord. Proj. of the Governments of
Canada and Ontario. 26 p. Doc.
10689VC. Parks Canada, Ottawa.

Canada-Ontario Rideau-Trent-Severn Study Committee. The Rideau
Trent Severn, A Report on Optimum Recreational Development.
Ottawa, Information Canada, 1975.

Canada-Ontario Rideau-Trent-Severn Study Committee. Optimum
Recreational Development in the Lake Simcoe-Couchiching Area.
Ottawa, Information Canada, 1973.

Quinte-Kingston Area: Yesterday, Today,
Tomorrow. 1973. Canada-Ontario-Rideau-
"rent-Severn Study Comm. 43 p. The
Queen's Printer, Toronto.

Haack, Lawrence E. 1975. Rivers of the Hiawatha. Naturalist 26(1):24-27.

Describes recreation opportunities on rivers in the Hiawatha National Forest of the Upper Peninsula of Michigan and gives a brief history of land use. Notes Forest Service multiple use management techniques employed in three use zones of the Forest: general forest, travel influence, and water influence.

HERITAGE CONSERVATION AND RECREATION SERVICE.
1978. PROTECTION OF OUTDOOR RECREATION VALUES OF RIVERS.
39 P. + APPEND. TASK FORCE REPORT, 1978 NATIONWIDE OUTDOOR
RECREATION PLAN, HERITAGE CONSERV. AND RECREATION SERV.,
WASHINGTON D.C.

EXAMINES ISSUES SURROUNDING RIVER PROTECTION IN THE UNITED
STATES AND PROPOSES ACTION ALTERNATIVES FOR IMPROVING AND
STRENGTHENING RIVER PROTECTION AND CONSERVATION. PROVIDES
CASE STUDIES ON THE SUWANEE RIVER IN GEORGIA AND FLORIDA AND
THE HOUSATONIC RIVER IN CONNECTICUT AND MASSACHUSETTS.

Higgins, J.F. 1972. "Easements for Wild and Scenic Rivers
Journal of Forestry. 70 (12).

Easements are being purchased by the U.S. government from persons owning land within the Clearwater component of the National Wild and Scenic River System. Describes a contract system which is entered into by the Forest Service and the land holder along the easement.

Hubbard, Fred Harvey. "Planning and Control of Recreation Use on Public Inland Lakes." Unpublished Ph.D. dissertation, University of Michigan, Ann Arbor, Michigan, 1962.

Jaakson, Reiner. 1971. Zoning to regulate on-water recreation. Land Econ. 47(4): 382-388.

Proposes a zoning system based on grouping those activities that exhibit similar density requirements and speed characteristics. Defines three activity zones: (1) a Shoreline Activity Zone, (2) an Open Water Zone, and (3) a Wildlife Zone. Guidelines for implementing the system are noted as are some of the legal, administrative, and ecological constraints that will necessitate certain alterations in the application of the model to different water bodies.

Jaakson, R. 'Recreation Zoning and Lake Planning'. Town Planning Review, 43(1), 1972. 41-55.

Jaakson, Reiner. Shoreline Recreation Planning: A Systems View. Occasional Paper #7. Faculty of Environmental Studies, University of Waterloo, Ontario, Canada. July 1973.

Jordahl, Harold C. Jr. "Conservation and Scenic Easements, As Experience Resume," Land Economics, 39 (4) (November, 1963), 343.

Kewlett, John D. and James E. Coughlass. "Blending Forest Uses," U.S.D.A. Forest Service Research Paper SE-37. Asheville, North Carolina: Forest Service, U. S. Dept. of Agriculture, Southeastern Forest Exp. Station, 1968.

- 1967 Wilderness values in the twentieth century. P. 91-94, in: Proc. Conf. Parks Outd. Rec. Conserv. Council. Ont., Toronto. (repr. with revision, P. 13-21, in: Why Wilderness? B.M. Littlejohn and D.H. Pimlott (eds.). Toronto: New Press and Algonquin Wildlands League).

Discusses the concept and values of wilderness and the Canadian attitude toward wilderness. Outlines what the author feels would constitute a reasonable approach to the satisfaction of wilderness demands, needs and values in Ontario: (1) suggests allocation of 3% of Ontario as wilderness and nature reserves (1/3 national parks, 2/3 provincial primitive parks and nature reserves, and primitive or natural zones in natural environment parks); (2) suggests that recreation be given primary consideration in planning forestry operations in multiple-use zones in natural environment parks, wild river parks and recreational reserves; (3) suggests that timber licenses be retired in provincial parks and a system similar to U.S. National Forests be set up; (4) suggests the development of wilderness travel routes over wide areas of the province in areas allocated to timber and mining where recreation would be a secondary use.

Michalson, Edgar L. 1975. Part C: wild and scenic rivers. In Regional problem analysis in the Pacific Northwest. p. 87-122. Wash. State Univ., Pullman, Washington.

Stresses the need for clarifying problems faced by multiple-agency management of rivers. Suggests that universities take an active role in river research and identifies four general areas needing investigation: (1) environmental problems; (2) carrying capacity (the establishment of limits, management, and the results of management); (3) commercial and non-commercial uses and demands; and (4) jurisdictional arrangement (functional, geographical, agency).

Friesnitz, Michael F., and James Harrison. 1977. Managing corridors in multiple ownership. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 183-186. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Planning and management techniques for river corridors in multiple ownerships are described. The lower St. Croix National Scenic Riverway between Minnesota and Wisconsin is used as an example.

RUPP, CRAIG W.

1970 Boundary Waters Canoe Area management. Naturalist
21(4): 3-7.

Discusses problems of management and some possible solutions in the BWCA. Includes such topics as: (1) needed research; (2) water pollution (restrictions on disposable containers, detergents, use of leaded gasoline, and development of a latrine which allows no leaching of waste); (3) management of vegetative cover (protection, fire, logging); (4) use restrictions (length of stay, size of parties, designated sites only, advance user reservations, specific routing, total number of people, reduced motor use, reduced snowmobile use, improved and/or reduced access points, rest rotation of campsites, closure and/or development of additional campsites, reduction of mechanized portages); and, (5) wildlife management.

Reigner, I. C. and L. G. Ningard. "Baltimore's Watersheds: An Example of Integrated Lane Use," American Water Works Association Journal, 59 (11) (November, 1967), 1469-1477.

Thompson, Glenn. 1976. Lucky river: the Little Miami. Environmental Comment, June 1976. p. 13-16. Urban Land Inst.

Briefly discusses the historical significance of the Little Miami River in southwest Ohio. Describes the processes that a nonprofit organization, Little Miami, Inc., undertook to rally support for protection of the River. Provides examples of accomplishments by the organization, individuals, and public agencies to protect the River.

U. S. Outdoor Recreation Resources Review Commission. Multiple Use of Land and Water Areas. Study Report No. 17, Washington, D.C.: U. S. Government Printing Office, 1962.

Whyte, William H. "Easements and Other Approaches," in Maine Coast Prospects and Perspectives: A Symposium. Brunswick, Maine: Center for Resource Studies, 1966. pp. 68-74.

Wilson, George T. 1964. Lake zoning for recreation: how to improve recreational use of lakes through regulation and control. 30 p. Am. Inst. Park Executives, Oglebay Park, Wheeling, West Virginia.

Offers guidelines for developing lake zoning ordinances and regulations. Provides administrators an understanding of the ecological problems involved in management of lakes for recreational purposes. Discusses the character of lakes, lake uses and activities, development cycle for lakes, space requirements for various uses, and the various means of regulation and control.

Yearout, Robert, Arthur Seamans, and Larry Lee. 1977. Regional river recreation management. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 188-192. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Describes the evolution of the Interagency Whitewater Committee in the West, its present functions, and the potential of such agency coordination for the future (in the East and the West). Emphasizes the need for considering a regional approach to river management.

G. SELECTED RIVER MANAGEMENT PLANS

Allagash River Authority. 1965. The Allagash--Maine's counter proposal. Am. For. 71(2):26-29.

Summarizes a plan for State control of the Allagash River. Objectives of the plan are to outlaw the use of motors on boats and canoes, limit the use of aircraft in the area, restrict the size and location of campsites, confine timber harvesting operations to an area 300 feet from the river bank, forbid new public access roads within the waterway, and restore historical sites along the River for recreational use.

Eastern Sports Council. A Regional Strategy for Water Recreation - Zone 1, The Great Ouse and Its Associated Waterways. Bedford, 1974.

Federal Register. 1972. Development and management plan, the Wild and Scenic Rogue River, Oregon. U.S. Gov. Print. Off. 37(131):13408-13416. Washington,

Federal Register. 1970. Middle Fork Feather Wild and Scenic River: classification, boundaries, and development plan. 35(45):4219-4222.

Federal Register. 1975. Upper St. Croix National Riverway: boundaries description. 40(32):6798-6802.

Gloucestershire County Planning Department & Wiltshire County Planning Department. Plan for the River Thames. Lechlade to Cricklade. Report. Gloucester & Trowbridge, 1971.

Huron River Watershed Intergovernmental Committee. The Importance of the Management of the Huron River Watershed. Ann Arbor, Michigan: Washtenaw County Metropolitan Planning Commission, 1964.

Interagency Whitewater Committee 1975. Interagency Whitewater Management Guidelines.

Present guidelines for white water river management developed by a committee composed of representatives from the Bureau of Land Management, National Park Service, U.S. Forest Service, and U.S. Coast Guard. The guidelines presented include: use limitations and allotments; regulation of commercial and private operations; operational requirements; public health and safety; and standardized permits.

The Nooksack Plan; Jones & Jones, 1973.

Jones and Jones Consultants. 1973. Recreation Plan for the Nooksack River. Whatcom County Park Board, Bellingham, Washington. 110 p.

Purpose of study was to determine reaches of the Nooksack River best suited for various types and intensities of recreation use (preservation, intensive and extensive). Development of the recreation plan for the river involved five steps. First an inventory of physical, cultural and aesthetic features along the river was carried out. Second, the study area was broken into segments based on visual corridors, watershed parameters, channel patterns, and geographic features. Third, the presence of 55 natural, cultural, and aesthetic variables along reaches were recorded. Fourth, river characteristics concerning "landscape integrity" were qualitatively evaluated. Indicators used were uniqueness, diversity, fragility, seasonality, and human encroachment. Each of the indicators were evaluated against appropriate variables. (This procedure which provides the basis for the planning recommendations is not methodologically rigorous). Lastly, recommendations concerning types and intensities of use were forwarded for each segment of the river.

McCool, Stephen F. 1972. Concept plan recommendations: Apple River recreation area. Tech. Rep. 1, 12 p. Univ. Wisconsin, River Falls, Wisconsin.

Describes tubing activities and high-density use on the Apple River near Somerset, Wisconsin. In 1971, an estimated 5,000 persons per hour floated on inner tubes down a short stretch of the Apple River. Concludes current overuse requires user control and management. Delineates a means of correcting the overuse problem through a method of self-management by the users.

Minnesota Department of Natural Resources.
1974. A Management Plan for the Kettle
River. p. 141.

Ohio University Development Planning Institute. 1967. The Little
Miami of Ohio - a study of a wild and scenic river.
Prepared for the Ohio Dep. Nat. Resour., Columbus,
Ohio. 56 p., illus.

Abstract: The Little Miami was one of the several important natural
rivers mentioned in federal legislation for wild or scenic
rivers. This report is a planning proposal for the river.
The river classifications proposed for the Little Miami
River include two Wild River Sections, one Scenic
Recreation River class, and one Urban River class. The
report includes recommendations concerning historic site
and recreation development, preservation, land acquisition
and funding. Appendices include: "water quality criteria
for aquatic life and recreation", "survey of opinions
concerning preservation, among residents of the Little
Miami Valley", and "proposed criteria for classifying
wild rivers, scenic recreation rivers and urban rivers".

Keywords: Waterway Planning, Land Acquisition, Waterway Classification,
Waterway Preservation, Ohio, Scenic Rivers, Recreational
Rivers, Urban Streams, Water Quality Criteria, Recreational
Potential. User Attitudes.

Parks Canada. 1978. "The Athabasca River, Jasper
National Park, Management Guidelines for Canoeing
and Kayaking."

Parks Canada. 1978. "The Bow River, Banff National
Park, Management Guidelines for Canoeing and
Kayaking."

Parks Canada. 1978. "The Kicking Horse River Yoho
National Park, Management Guidelines for Canoeing
and Kayaking."

Parks Canada. 1978. "The Vermilion-Kootenay River System, Kootenay National Park, Management Guidelines for Canoeing and Kayaking."

Parks Canada, 1978. "The Waterton and Belly Rivers, Waterton Lakes National Parks, Management Guidelines for Canoeing and Kayaking."

Potomac Planning Task Force. The Potomac--A Report on Its Imperiled Future and Guide for Its Orderly Development. Washington, D.C.: U. S. Government Printing Office, 1967.

St. Croix Task Force. 1970. Wild waters of the St. Croix: a plan for preservation and management. 57 p. St. Croix Task Force, Minneapolis, Minnesota.

Identifies the environmental resources on the St. Croix River in Wisconsin and Minnesota that are worthy of preservation/restoration, and suggests methods to optimize management of the resources. Evaluates type and density of recreational use in the area and relates it to present facilities and management goals. To increase the tax base of the area, the private sector is encouraged to develop support facilities compatible with wild and scenic river status.

St. Croix Task Force. 1970. Wild waters of the St. Croix: a plan for preservation and management--addendum report. 78 p. St. Croix Task Force, Minneapolis, Minnesota.

Supplements the initial report. Contains information on shoreline controls, existing and proposed recreation facilities in the St. Croix-Namekagon area, and physical characteristics of the area.

Texas Parks and Wildlife Dept. Pathways and Paddleways conducted by Wayne D. Oliver, Clyde M. Beggs, Candy Ashier Finney, Ron Thuman under the direction of Ron D. Jones, Director of Planning, Austin, Texas 1971 50p. Copy location ARC

*Public Response on Alternatives
and Tentative Recommendations;
Skagit River Study, USFS, March
1973.*

USDA-Forest Service. 1973. "Multiple Use Management Guide for the Middle Fork of the Clearwater." 55 p.

Document provides recommendations pertaining to recreation, range, timber, water, wildlife, soils, wilderness, minerals, land-use, transportation, fire control, and insect and disease control. Recommendations are of interest but lack substantiation. Plan approved in 1973 and is currently being revised

U. S. Forest Service. Multiple Use Management Plan for National Forest Lands: Lake Tahoe Basin. San Francisco, California: U. S. Forest Service Region 4 and 5, 1962.

USDA - Forest Service. n.d. "Management Plan for Float-boating on the Upper Salmon River."

Plan deals with a variety of management problems, along a ten mile reach of the Salmon River. Identified management problems include: use allocation, fishing (conflicts between fishermen and floaters, impact on anadromous fisheries), location of lunch stops, camping, sanitation, safety. Recommendations pertaining to the above are included.

USDA - Forest Service. n.d. "Illinois River Study: Alternatives for Inclusion into the Wild and Scenic River System:"

Public participation information brochure presents five alternatives to the rivers inclusion in the Wild and Scenic River system. Various social, economic and environmental implications are outlined for each alternative.

USDA-Forest Service. n.d. "Recreation Management Plan: Middle Fork Salmon Wild and Scenic River." 40 p.

The plan provides: 1) an analysis of recreation resource, current and future supply-demand relationships, and recreational opportunities along the river, 2) evaluation of existing and future needs regarding management facilities and personnel, and 3) a discussion of recreation management provisions. Although the plan is directed primarily towards commercial rafting, it is of use due to the careful documentation of all recommendations.

Middle Fork Salmon Wild and Scenic River
Recreation Management Plan. 1973.
Challis and Salmon Natl. For., p. 33.
USDA For. Serv., Ogden, Utah.

USDA-Forest Service. n.d. "Selway River Whitewater Management Plan." 1976, 39 p.

Document provides a management plan for whitewater boating on a 47 mile reach of the Selway River from Paradise gauge station to Selway Falls. Provides a system for inventorying and classifying river campgrounds based primarily upon maximum campground capacity. Contains detailed discussion of floating requirements and conditions for commercial raft operators. Appendices include information brochure for private river users, discussion of hypothermia, and procedures for search and rescue.

USDA-Forest Service. n.d. "Recreation Management Plan-National Forest Lands along the Middle Snake River." 63 p.

Good discussion of recreational use characteristics and site capacity along the canyon. Develops basis for determination of capacity limits through consideration of: 1) management objectives, 2) visitor attitudes, 3) impact on physical resources, and 4) physical site limitations. Visitor attitudes were ascertained through a user preference survey.

U.S. Department of Interior, Bureau of Outdoor Recreation. 1976. Northeast regional states scenic rivers planning workshop. Summary of Proceedings. May 25-27, 1976. Rexford, Pennsylvania. 117 p.

Summarizes the discussions of State and Federal resource administrators responsible for river planning and management in the Northeast. Important topics discussed were: (1) the river study process; (2) the river designation process; (3) the development of a river management plan and implementation process; and (4) status of the National and Wild Scenic River System

A Report on the Proposed Allagash National Riverway. Washington, D.C.: Bureau of Outdoor Recreation, U.S. Department of the Interior, 1963.

USDI-National Park Service. n.d. "Whitewater River Management at Dinosaur National Monument."

Deals with the problem of equitable allocation of use permits to private and commercial river users.

USDI-National Park Service. n.d. "Dinosaur National Monument: Boating Regulations."

Includes regulations regarding boat specifications, required equipment standards for commercial raft operators, and pertinent park regulations (camp-sites, fire, water, access). Section on private users (canoes and kayaks) discusses policy regarding approved boats, experience required, party size and equipment.

USDI-Bureau of Land Management. n.d. "Rogue National Wild and Scenic River, Oregon: Notice of Revised Development and Management Plans." Federal Register.

Summary of management policies upon legislative approval.

USDI - Bureau of Land Management n.d. "Salmon-Snake Visitor Management Plan".

Document is presented in four parts.

Part one deals with public safety under three areas - education, search and rescue, and detection and elimination of hazards. Parts two and three deal with services and facilities respectively. Part four discusses aspects of visitor management designed to direct the recreationists behavior or actions. The section deals with the establishment of carrying capacity limits, co-ordination of diverse government agencies to assist in realizing goals, and types of intensities of recreational use.

"Potomac Valley - A Model of Scenic and Recreational Values," a preliminary report of the joint federal-state planning team on landscape and recreation, Project Potomac, U. S. Department of the Interior, May 1966. U. S. Government Printing Office, \$4.00. 57.

"The Nation's River," The Department of the Interior official report on the Potomac, October 1968. 53.

U.S. National Park Service, 1975. Buffalo National River: Final Master Plan. 54 p.

The Buffalo River in Arkansas was designated as a national river in 1972. Report gives a description of accessibility, the watershed, river hydrology, morphology and "Floatability", and natural history. Applies U.S. National Parks land classification system along shorelands within national river boundary. Develops visitor use and resource management plans within constraints of land zones.

USDI-National Park Service. n.d. "Canyonlands National Park: River Management Plan." 41 p.

Comprehensive plan with clear definition of management objectives and factors affecting management strategies. Report also contains detailed policy and operation guidelines. Appendix contains good section on required visitor regulations.

USDI - National Park Service n.d. "Interim Management Plan: Colorado River Float Trips - Grand Canyon National Park."

Provides management policies and operations decisions relating to types and intensities of use and required visitor services. Some discussion of use capacities is included.

U.S. Forest Service

Green River Management Plan, 1975. 54p.

Inventory of physical, environmental, historical, archeological and recreational assets; management objectives, resource problems and impacts and future recreational needs

copy location: ARC Lib

US Bureau of Land Management

Vernal District River Management Plan-Green River:

from Flaming Gorge Dam, Colorado to

Utah, 40p.

copy loc ARC library

USDI Upper Missouri Wild and Scenic River Management Plan

Final Report Supplement, Dept. of the Interior Bureau of Land Management. 159 p. Lewiston, Montana.

copy location ARC library

USDI. Upper Missouri Wild and Scenic River Management Plan

Final Report, USDI Bureau of Land Management 76p

A management plan for the Upper Missouri Wild and Scenic River Act, 1978.

Copy Loc, ARC library.

USDI Bureau of Land Management

Laguna - Martinez Management Plan Draft.

Yuma District Office, Yuma Resource Area, Yuma Arizona. 7-9-1979. 48p.

copy loc. ARC Branch

USDI. Bureau of Land Management,

Ehrenberg - Cibola Management Plan.

Yuma District office, Yuma Resource Area

Yuma, Arizona. 1975.

copy location ARC Branch

USDA

Salmon River North fork to the Nezperce Forest

Boundary Near Riggins Idaho Management Plan. 50p.

Copy location ARC library

USDA Forest Service. River Plan Rogue.

Siskiyou National Forest, Oregon, 1969. 50p.

Copy loc. ARC library

USDA Forest Service. Draft Wild and Scenic River Study, Tuolumne County, California.

U.S. National Park Service

A Master Plan for the Proposed Voyageurs National Park
Planning, Canoe Routes, Kabetogama Peninsula, fur trade,
natural features 1968

U.S. Dept. of Interior

National Parks Service

Washington, D.C.

ARC Library

U.S. States of Minnesota & Wisconsin

Wild Waters of the St. Croix:

A plan for Preservation and Management.

Location ARC Branch

USDA St. Joe River Wild and Scenic Rivers Study Report and
Final Environmental Statement. St. Joe National Forest

St. Maries, Idaho 140 p. Sept. 1976

copy location: ARC Branch 22th floor

USDI St. Croix Master Plan National Scenic River-

National Scenic Riverway. Minnesota, Wisconsin. 1971.

location ARC lib.

USDI St. Croix final Master Plan-National Scenic Riverway

Oct 1976 59p

location ARC Branch

USDI Lower St. Croix Final Master Plan-National Park Service

State of Minnesota & Wisconsin Feb. 1976 80 p

Location ARC Branch 22th floor

U.S. Department of Interior, National Park Service,

1976, Lower St. Croix final master plan p. 79

States of Minnesota and Wisconsin.

USDI, National Park Service,

Draft-Colorado River Management Plan

Gran Canyon National Park Oct 1975 p. 23

USDI, National Park Service

Buffalo National River Master Plan

Arkansas, Feb. 1977. 60p.

copy location ARC Branch

USDA, Forest Service

River-Plan Middlefork of the Feather

Plumas National Forest, California, 20p March, 1970.

copy location ARC Branch

USDA. A proposal for the Salmon River Idaho National Wild and Scenic Rivers System, June, 1976. 140p
copy location ARC library 22th floor

USDA Forest Service Middlefork of the Clearwater including the Lochsa & Selway River Plan.
Nezperce National Forest, Idaho sep. 1965, 50p
location ARC Branch 22th floor

USDA Army Corps of Engineers Big South Fork, Cumberland River, Kentucky and Tennessee Interagency Report to committee on Public Works
dec., 1969. 138p,
Copy Location ARC Branch 22th floor

USDA Forest Service & USDI Dolores River Wild and Scenic River Study Report december, 1975. 100p.
copy location ARC Branch 22th floor

USDA A Design for Wild & Scenic Rivers Middlefork Clearwater Selway House. 35 p
location ARC Branch 22th floor

S.R. Stenson. South Platte River Development Plan.
Recreational Development, Bridle Path, Bicycle Path, Fish, Arboretum
1969.
Deboer and Co.
Denver, Colorado 80200

Orange County General Planning Program Santa Anna River - Santiago Creek Greenbelt Plan
Orange County General Planning Program
211 West Ana Blvd.,
Santa Ana, Calif.
92701

US Alaska Planning Group
Proposed Birch Creek National Wild River
Alaska-Washington. USDI. 1975. 404p.
Final Environmental Statement, USDI
Ministerial lib 14th QH 76.5.A4 US8

US Alaska Planning Group. Proposed Aniakchak Caldera National Monument/Aniakchak Wild River, Alaska, Wash. USDI. 1973. 186 p.
Ministerial lib. 14th floor QH 76.5.A4
452

U.S. National Park Service. Preliminary Geographical Survey of the
Kongakut - Firth River Area, Alaska/Canada, Wash. 1954
Ministerial lib. 14th GB 126 A445
Archeological reference Cited p. 48

National Park Service Wilderness Recommendation; Buffalo
National River, Arkansas, March, 1975. 54p.
copy location ARC Branch.

USDA Forest Service. The Skagit, A Study of the Skagit, Cascade, Sauk, and
Suiattle Rivers in Washington State for possible inclusion in the
National Wild and Scenic Rivers System, 1976. 203p.

USDI A survey of Rivers in the Adirondacks to identify potential
National Wild and Scenic Study Rivers. Oct. 1975 40p
copy loc. ARC Branch.

USDI Bureau of Outdoor Recreation
Study Report on the Wolf River, Wisconsin.
prepared by the lake Central Regional Task Group
Sept 1964
copy location ARC library

The Lower Wisconsin: A Wild and Scenic River Study
Field Report Informal Draft. Nov. 1976 Ann Arbor, Michigan.
212 p
copy location ARC library

U.S. Bureau of Outdoor Recreation
The Middle Missouri, A Rediscovery: A study of the
Outdoor Recreation Potential
rivers, recreational resources, regional planning, historic sites,
national recreation areas, legislation, federal-state co-operation
1968
U.S.
Government Printing Office
Washington 20402
104 pp
\$1.25 1

U.S. Bureau of Outdoor Recreation
New England Heritage: The Connecticut River National recreation
area study.
heritage area studies, cooperative planning, natural resources,
legislation, maps, tables
1968
U.S. Govt. Printing Office
Washington, D.C.
20402
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98 pp \$1.00

US Alaska Planning Group USDI
Forty Mile National Wild and Scenic River, Alaska
Final Environmental Statement.
1975.422p.
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US Alaska Planning Group
Proposed Unalakleet National Wild River, Alaska.
Wash, USDI. 1975.285p.
Ministerial lib 14th QH 75.5.A4 454

US Alaska Planning Group
Proposed Yukon Delta National Wildlife Refuge, Alaska Washington,
1974 550p
Ministerial lib 14th QH 76.5.A4

USDI Draft report on a study of the Youghiogheny River a possible
addition to the National Wild and Scenic Rivers System.
prepared by USDI Bureau of Outdoor Recreation, december, 1976.85p
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U.S. Dept. of Interior
Bureau of Outdoor Recreation
Washington, D.C.
Little Beaver Creek, Ohio
Scenic River Report
National Wild and Scenic Rivers System,
Recommendation for Inclusion.
Dec. 1975

USDI The Upper Mississippi. A wild and scenic River Study
field level report informal review, draft, August. 1976
USDI Lake Central region 3853 Research Drive, Ann Arbor
Michigan 275p
location ARC Branch

USDI Osark Rivers National Monument: A proposal.
Feb., 1960. 116 p.
copy location ARC Branch

USDI National Park Service. Proposal: Buffalo National River, Arkansas
1968 24. p
copy location ARC Branch

USDI Wild and Scenic River Study Upper Mississippi River, Minn.
Bureau of outdoor recreation sept. 1977 Washington 215p
location ARC Branch

USDI - National Park Service n.d. "Proposed Snake River Management Plan - Grand Teton National Park Wymoing. 101 p.

Use along the section of the river under consideration is largely limited to short half-day float trips. Document contains a discussion of impacts of heavy river use on the natural and recreational environment. Alternate management strategies and the implications are described in some detail. The alternate strategies include:
1) no further action; a) active promotion and increased development of facilities; 3) limiting use and undertaking intensive management; and 4) management of river flood plain lands as a wilderness area.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. Master plan for the Rogue River component of the National Wild and Scenic Rivers System. 91st Congr. 1st. sess., House Document 91-175. 108 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. River plan for the Middle Fork of the Clearwater River. 91st Congr. 1st. sess., House Document 91-169. 31 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. Eleven Point River Plan, Mark Twain National Forest, Missouri. 91st Congr. 1st. sess., House Document 91-167. 41 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1976. Message from the President transmitting a report on Little Beaver Creek, Ohio (Wild and Scenic Rivers Act). 94th Congr. 2nd. sess., House Document 94-364. Document not printed.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1973. Recommending the addition of the Little Miami River, Ohio, to the National Wild and Scenic Rivers System. 93rd Congr. 1st. sess., House Document 93-184. 103 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. The plan for the Rio Grande National Wild and Scenic River. 91st Congr. 1st. sess., House Document 91-174. 53 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. River plan for the Rogue River in Oregon. 91st Congr. 1st. sess., House Document 91-170. 56 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1972. A proposed combined Bureau of Land Management and Forest Service plan for the development, operation, and management of that segment of the Rogue River under the administration of the Bureau of Land Management and Forest Service in Oregon, which is part of the Wild and Scenic Rivers System. 92nd Congr. 2nd. sess., House Document 92-380. 224 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. River plan for the Middle Fork of the Salmon River. 91st Congr. 1st. sess., House Document 91-171. 47 p.

Vance, Mary. State Outdoor Recreation Plans. Monticello, Illinois: Council of Planning Librarians Exchange Bibliography, 1967.

3. LEGISLATION AND POLICIES GOVERNING HERITAGE RIVER RESOURCES

A. CANADIAN LEGISLATION AND POLICIES

1977 British Columbia's Trails, Rivers, and Shorelines--A Status Report. (Interim Report to the Ministry of Recreation and Conservation) Vancouver: Outdoor Recreation Council of B.C.

British Columbia Wildlife Federation. 1973. Wild Rivers - a proposal for wild, scenic and recreation rivers in British Columbia. (text by Geoff Warden and Ed Mankelow, B.C. Wildl. Fed.), booklet, 24 p. illus.

Abstract: Proposes that B.C. should protect Wild, Scenic and Recreational Rivers through legislation that broadly adopts the American three-class concept with some slight modification. Outlines the criteria and recreational use for each of the three classes. The Gitndox River (a tributary of the Skeena) is proposed as a Wild River; the Chilko-Chikcotin (a tributary of the Fraser) as a Scenic River; and the Cowichan (on Vancouver Island) as a Recreational River. The characteristics of each river to warrant their classification are discussed.

Keywords: Wild Rivers, Scenic Rivers, Recreational Rivers, Waterway Classification, Waterway Preservation, British Columbia.

Canada Dept. of Indian Affairs and Northern Development. 1973. Byways and special places. DIAND Natl. Hist. Parks Br., Planning Div., Ottawa. publ. #OS-1202-000-BB-A-1, 71 p., illus.

Abstract: This illustrated booklet presents a general view of the present extent of national and historic parks in Canada. The location and number of Canada's scenic land routes, major historic water routes and major historic land routes are illustrated. Outlines the idea of extending the present parks system to include such park types as canal systems, national marine parks, national landmarks, and wild rivers. Additional new initiatives include historic waterways, historical land trails, and scenic and historic parkways. In this overall National and Historic Parks plan is envisioned a national system of varied types of parks distributed throughout Canada, providing for numerous recreational activities and purposes.

Keywords: Waterway Preservation, Waterway Classification, Canals, Historic Waterways, Canada.

Cheffins, William F. 1977. New initiatives in heritage preservation: the agreements for recreation and conservation program of Parks Canada. In: River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 232-235. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Parks, Canada, has created a new Program--Agreements for Recreation and Conservation (ARC) to ensure the preservation of a broad range of human and natural heritage resources and to meet the changing leisure-time needs of Canadians. Describes the ARC Program and its charter to identify, plan, preserve, develop, and manage historic waterways, historic land trails, wild rivers, and heritage areas.

PERRY, THOMAS, JR.
1976. CANADA'S WILD RIVERS: HAVE THEY A FUTURE?
NATURE CANADA 5(3): 9-14.

DISCUSSES THE HISTORICAL ROLE OF RIVERS AND RIVER DEVELOPMENT IN CANADA, AND FUTURE DEVELOPMENT THREATS TO REMAINING FREE FLOWING RIVERS. DESCRIBES THE WILD RIVERS SURVEY OF PARKS CANADA AND THE RIVER POLICIES OF THE PROVINCIAL GOVERNMENTS. NOTES SOME OF THE PROBLEMS INVOLVED WITH WILD RIVER PRESERVATION IN CANADA.

Schaber, Wallace. Survey of Park Protection Available for Canada's Wild Rivers. 1974.

Provision for wild river preservation at the provincial level is in its infancy. Though Ontario has established 5 wild river parks by order-in-council, protecting a minimum 400 foot corridor on either side of the river from development, it has not yet prepared any master plans for these areas. Interest in the development of all types of trail systems, including wild rivers, has grown as a result of federal-provincial parks conferences; New Brunswick, Alberta, and British Columbia are moving toward the sort of trail system planning which Ontario is presently developing. While provincial objectives tend to favour development of wild rivers to accommodate increasing demand, federal programmes emphasize preservation and protection from development pressures. The Sierra Club and other conservation groups are currently applying public pressure for protection of such rivers as the Missinaibi in Ontario, major portions of the Churchill in Saskatchewan and Manitoba, and portions of the milk and South Saskatchewan in Alberta.

Warden, G. and E. Mankelow. 1973. "Wild Rivers - A Proposal for Wild, Scenic and Recreation Rivers in British Columbia." British Columbia Wildlife Federation. (booklet), 24 p.

Proposes that B. C. should protect Wild, Scenic, and Recreational Rivers through legislation that broadly adopts the American three-class concept with some slight modification. Outlines the criteria and recreational use for each of the three classes. The Gitndox River (a tributary of the Fraser) as a Scenic River, and the Cowichan (on Vancouver Island) as a Recreational River. The characteristics of each river to warrant their classification are discussed. (Abstract from Dooling, 1975).

B. UNITED STATES LEGISLATION AND POLICIES

Alling, Curtis Edwin. 1977. An identification and analysis of the critical obstacles encountered in the creation of State natural rivers programs. M.S. thesis. Dep. of Recreation and Parks, Texas A&M Univ., College Station, Texas. 71 p.

Data collected from 40 States that have taken recent action to protect natural river systems was analyzed to identify and try to devise methods to overcome the obstacles encountered by State agencies as a result of their actions to establish natural river programs. Four principle obstacles were: (1) opposition of the local community, (2) lack of administrative support from higher levels of State government, (3) competition for the river corridor resources with other uses, and (4) lack of visible constituents to offer support. Methods are suggested to overcome these obstacles. Concludes that no one alternative is a solution for overcoming the obstacles, and that each area should be dealt with individually.

American Enterprise Institute for Public Policy Research. Legislative Analysis: The Water Pollution Control Bill. Washington, D.C.: American Enterprise Institute for Public Research, 1966.

Anonymous. "Are Water Rights Marketable in Wisconsin?" Wisconsin Law Review, (1966), 942.

Anonymous. "Public Recreation on Nonnavigable Lakes and the Doctrine of Reasonable Use," Iowa Law Review, 55 (April, 1970).

Anonymous. "Constitutional Revision--Water Rights," National Resources Journal, 9 (July, 1969), 471.

Anonymous. "Constitutional Sanctity of a Property Interest in a Riparian Right," Washington University Law Quarterly, (Summer, 1969), 327.

Anonymous. "Modification of the Riparian Theory and Due Process in Missouri," Missouri Law Review, 34 (Fall, 1970), 562.

Anonymous. "Riparian Rights Doctrine in South Carolina," South Carolina Law Review, 21 (1969), 757.

Anonymous. "Riparian Water Law--Lakeshore Development," Wisconsin Law Review. (1966), 172.

Anonymous. "Water Law--Artificial Versus Natural Fluctuation of Water Level of Navigable Lake--Rights of the Public Held Same in Both Situations," Land and Water Law Review 5 (1970), 517.

Beuscher, J. H. "Current Trends in Wisconsin's Water Law." Wisconsin Bar Bulletin 19, (April, 1967).

Beuscher, J. H.; J. P. DeBraal; H. H. Ellis and C. D. Howard. Water-Use Law and Administration in Wisconsin. Madison, Wisconsin: Department of Law, University Extension, University of Wisconsin, 1970.

Bock, William, and Frank Thomas. 1974. A look at the Wild and Scenic Rivers Act. Tech. Assist. Pap. Ser. B, Pap. 1, 18 p. USDI Bur. Outdoor Recreation.

A quick reference guide consisting of two parts: (1) self-explanatory outline of the Act, and (2) legal opinions that answer frequently asked questions about the interpretation of the various sections and phrases of the Act.

Clark, Robert Emmett, ed. Water and Water Rights. Vol. I and II, Allen Smith, Indiana, 1967.

Clyde, E. W. "Mineral Rights Versus Water Rights," Natural Resources Law, 2 (November, 1969), 299.

Craighead, John J. 1966. Wild Rivers...in a national scenic rivers system. Naturalist 17(2):29-31.

Analyzes the effectiveness of a wild rivers bill proposed in the 1965 U.S. Senate. Notes lack of river classification system, specific administrative objectives, and methods for evaluating changes in use patterns and user impacts on rivers. Compares wilderness management legislation with proposed river legislation.

Curtis, Eric J. 1977. Some legal aspects of river recreation management in the East. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 8-18. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The theme is the almost incredible multiplicity and the complex interrelation of overlapping governmental controls and private lawsuits affecting rivers and streams in the East. A basic formula or approach to help identify, understand, and distinguish these interwoven legal control mechanisms is presented. Certain basic principles, cases, and authorities are incorporated into fable form based upon Siegfried's Rhine Journey.

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Ellis, Willis H. 1966. Watercourses-recreational uses for water under prior appropriation law. Nat. Resour. J. 6(2):181-185.

Reviews the 1965 court case, Colorado River Water Conservation District versus Rocky Mountain Power Company, in which the District sought to specify rates of flow necessary for fish life in order to prevent further water diversion by the Company. Colorado Supreme Court denied the District the water rights it claimed based on the decision that the State of Colorado has no legal authority to acquire water rights for fish propagation without making a diversion, such as a retaining pond, from the stream. This decision appears to conflict with a 1937 decision that empowered the District to hold sufficient water from natural streams to preserve fish for the benefit of the recreating public.

Ford, Charles R. 1975. Effect of new legislation on management of river systems. 40th North Am. Wildl. Nat. Resour. Conf. Trans. 40:273-280.

Several recent laws--the Water Resources Development Act of 1974, the Flood Disaster Protection Act of 1973, the Disaster Relief Act Amendments of 1974, the Housing and Community Development Act of 1974, and the Federal Water Pollution Control Act Amendments of 1972--will have a major impact on river management. These laws give the Federal agencies, that are responsible for water resources planning new and improved authority for managing rivers with multiple purposes with multiple means. A brief summary of the parts of each act relevant to improving the management of river systems in urban areas is given. Opportunities for improving the urban environment, preserving green space and wetlands, and conserving and enhancing wildlife are also summarized.

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Lewis, J. Harry. 1977. TVA's role in river-oriented recreation. *In* River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 139-141. North Cent. For. Exp. Stn., St. Paul, Minnesota.

The Tennessee Valley Authority, in cooperation with other agencies and organizations, has surveyed a number of streams, acquired public access, developed parking and recreational facilities, prepared descriptive brochures, rated canoeing difficulty, and regulated streamflows from its dams. Suggests that providing use, not restricting it, is the agency's present course.

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Minnesota Outdoor Recreation Resources Commission. 1965. Recreational use of the
St. Croix River. MORRC Study Rep. 11, 42 p. St. Paul, Minnesota.

A geographical and recreational description of the St. Croix watershed, including an inventory
of recreation sites, general land uses, and ownership patterns is provided. Reviews laws and
studies related to recreational use of the St. Croix. Presents selected recreation use
statistics.

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easements. p. 17.

Pfister, Robert E. 1975. Protection of free flowing rivers. In Water Resources Policy Issues--1975. p. 63-72. Water Resour. Res. Inst., Oregon State Univ., Corvallis, Oregon.

Examines the federal legislative mandate to protect free-flowing rivers and notes challenges to be faced in implementing the policy. Identifies research needs for wild and scenic rivers such as the attitudes of public agency personnel, the impacts of use controls on river users experiences, and the methods to assess intangible benefits of river experiences.

Priesnitz, Michael. 1975. The rivers that run on borrowed time. Naturalist 26(1):7-12.

Reviews State of Minnesota river management and planning procedures, including the 1973 Minnesota Wild and Scenic Rivers Act that was aimed at preserving rivers for recreation. Discusses the characteristics and potentials of the Kettle and Mississippi Rivers as possible additions to the State's wild and scenic rivers system--both rivers are close to the St. Paul-Minneapolis metro area and are under pressure to be developed.

THIS ARTICLE DESCRIBES IMPLEMENTATION OF THE MINNESOTA WILD AND SCENIC RIVERS ACT OF 1973 BY THE MINNESOTA DEPARTMENT OF NATURAL RESOURCES. THOUGH THE WILD AND SCENIC RIVERS SYSTEM CREATED BY THE ACT DID NOT INITIALLY INCLUDE ANY RIVERS, THE KETTLE, THE MISSISSIPPI (ST CLOUD TO ANOKA), AND THE NORTH FORK OF THE CROW WERE DESIGNATED FOR STUDY. DRAFT MANAGEMENT PLANS HAVE BEEN COMPLETED FOR THE FORMER TWO. PUBLIC HEARINGS ARE BEING CONDUCTED TO REVIEW THESE PLANS AND DISCUSS POSSIBLE INCLUSION OF THE RIVERS. DESCRIPTIONS OF THE HISTORY AND CHARACTERISTICS OF THE TWO STUDY RIVERS ARE PROVIDED.

Priesnitz, Michael. 1976. Minnesota's river program. Environmental Comment, June 1976. (A publication of the Urban Land Institute) p. 5-9.

Reviews provisions of Minnesota's Wild and Scenic Rivers Act. Discusses ways to preserve rivers through zoning and scenic easements. Notes the importance of effective communication with the public and the involvement of the public in carrying out program objectives.

Rainwater, Frank H. "Role of the Federal Water Pollution Control Administration in Water Resources," in Proceedings of the Second Annual American Water Resources Conference, November 20-22, 1966. Proceedings Series Number 2. Urbana, Illinois: American Water Resources Association, 1966, pp. 454-459.

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Briefly describes provisions in the National Wild and Scenic Rivers Act of 1968 to protect free-flowing rivers. Notes that the primary aim of the National Wild and Scenic Rivers System is to maintain the status quo along designated rivers.

Peters, Clay E. 1975. A national systems of wild and scenic rivers. Naturalist 26(1):28-31.

Briefly traces the history of the National Wild and Scenic Rivers Act of 1968: rationale for such a river system, processes that add new rivers to the federal system, types of river classification possible (wild, scenic, or recreational), and various management efforts to preserve rivers (zoning, conservation, scenic easements, etc.).

THE NATIONAL WILD AND SCENIC RIVERS ACT OF 1968 HAD ITS ROOTS IN RECOMMENDATIONS BY THE NATIONAL PARK SERVICE AND OTHERS DURING THE LATE 50'S AND EARLY 60'S. A PRODUCT OF MUCH CONTROVERSY, THE ACT IS DESIGNED TO ESTABLISH A SYSTEM OF RIVER SEGMENTS WHICH WILL BE PROTECTED AND PRESERVED IN AN UNDEVELOPED OR LIGHTLY IMPACTED STATE. 8 SPECIFIC RIVER SEGMENTS WERE INITIALLY INCLUDED IN THE SYSTEM, AND 27 OTHERS IDENTIFIED FOR STUDY AS PROMISING CANDIDATES. RIVERS CAN BE ADDED TO THE SYSTEM BY ACT OF CONGRESS OR, WHERE NOMINATED BY STATE GOVERNMENTS AND NO FEDERAL ADMINISTRATIVE COST IS INVOLVED, BY THE SECRETARY OF THE INTERIOR. TO DATE, 2 RIVERS HAVE BEEN ADDED BY THE FORMER PROVISION, AND 3 BY THE LATTER. IN JANUARY 1975 CONGRESS ADDED 29 RIVERS TO THE STUDY LIST. THE ACT RECOGNIZES 3 RIVER SEGMENT CATEGORIES: WILD, SCENIC, AND RECREATIONAL. THE PROTECTED CORRIDOR ALONG THE ORIGINAL 8 RIVERS IS LIMITED TO AN AVERAGE WIDTH OF ONE-HALF MILE. PURCHASE OF SCENIC AND CONSERVATION EASEMENTS, AS OPPOSED TO FEE TITLE PURCHASE, IS ENCOURAGED AS A MEANS OF CONTROLLING ACQUISITION COSTS. ESTABLISHED RIVER UNITS ARE ADMINISTERED BY THE FOREST SERVICE, THE NATIONAL PARK SERVICE, OR ON RARE OCCASION, BY THE BUREAU OF LAND MANAGEMENT.

Reis, Robert I. "Policy and Planning for Recreational Use of Inland Waters."
Reprint from Temple Law Quarterly. Philadelphia, Pennsylvania:
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Illinois, Ph.D., 1965. Page 1142, Volume 26/02,
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River Conservation Fund. 1977. Flowing free: a citizen's guide for protecting wild
and scenic rivers. 76 p. River Conserv. Fund, Washington, D.C.

Approaches that may be useful in river preservation are presented. The National Wild and
Scenic Rivers Act is discussed. The designation process is explained, classification
criterion and objectives are presented, and the present status of the System is detailed.
State Wild and Scenic Rivers programs are briefly reviewed and a list of State contacts is
provided. Examples of local and private preservation efforts are presented as are processes
that may be useful in mobilizing the grassroots support needed in a preservation effort.

Saltonstall, Richard, Jr. 1976. What do
you say John Muir? Not Man Apart,
May 1976; 11 p.

Sargent, F. O. "Multiple Use and Water Law," Proceedings of Water Rights
Law Conference. Sponsored by the New England Council of Water Center
Directors, Boston, Massachusetts, November 10, 1966, pp. 87-96.

Schulz, W. F., Jr. Conservation Law and Administration. New York:
The Roland Press, 1953.

Simmons, Robert M. 1977. Legal aspects of river recreation management in the West. In River recreation management and research Symp. Proc. USDA For. Serv. Gen. Tech. Rep. NC-28, p. 32-37. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Analyzes the levels of law the river manager should be familiar with; emphasis is on the recent Federal statutes affecting the use of the Nation's waterways. Also analyzes the effects of determining: (1) the navigability of a waterway, (2) the importance of the reservation doctrine, and (3) the effect of existing and future appropriations on river recreation management.

The Politics of Water Resource Management in the Tucson, Arizona S.M.S.A. *Siraayer, John Adrian*. University of Arizona, Ph.D., 1967. Page 1491, Volume 28/04-A, DA1.

..... Order No. 67-11,956

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..... Order No. 7742

Tarlock, Dan A., and Roger Tippy. 1970. The Wild and Scenic Rivers Act of 1968. Cornell Law Rev. 55(5):707-739.

Reviews origins of legislation that led to passage of the Rivers Act and formation of the National Wild and Scenic Rivers System. Discusses the importance of acquiring lands along the river to provide a protective river corridor. Also reviews management guidelines established to protect rivers.

"Water Laws and Concepts," Harold E. Thomas, Geological Survey Circular 629, 1970. 56.

Threinen, C.W. 1970. The status of wild rivers in law and action program - 1970. Dept. Natural Resources, Fish Manage. Bur., Manage. Rep. No. 37, Madison, Wisconsin. 22 p.

Abstract: A summary of the status and action-in-progress of wild river waterway preservation in Wisconsin by state, federal and county governments. Shoreland, floodplain, and public land ownership zoning are important tools in defending the wild river concept; a summary of the status of zoning in counties is, therefore, provided. For example, shoreland and floodplain zoning reserve the flood plain, require setback of housing a minimum distance, provide minimum lot widths and prohibit substantial alteration of vegetation over more than 30 percent of the shore ownership. Lands fronting on the river have a 200-foot-wide aesthetic management zone. The U.S. Federal Wild Rivers Law and State Wild Rivers law are provided in an appendix.

Keywords: Wild Rivers, Wisconsin, Zoning, Waterway Classification.

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Turner, Robert C. 1974. The preservation of rivers as wild and scenic. In *Environmental planning: law of land and resources*. p. 8.1-8.16. Arnold W. Reitze, Jr., ed. North Am. Internl., Washington, D.C.

Presents a brief history of the Wild and Scenic Rivers Act. Comments on the procedures followed to preserve rivers under the Act and the management guidelines followed to protect both the river and its corridor. Riverways that are protected by other Federal legislation, such as the Jacks Fork and Current Rivers in the Missouri Ozarks and the Buffalo River in Arkansas, are also mentioned. The effectiveness of measures used to protect these rivers are briefly compared with measures used to protect rivers under the Wild and Scenic Rivers Act. State scenic river programs as they relate to eligibility requirements for Federal land and water conservation funds are discussed also.

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U. S. Congress. Watershed Improvement Programs--Loans. An Act to amend the Watershed Protection and Flood Prevention Act to provide that its loan provisions shall be applicable to certain other projects, and for other purposes. Public Law 468, 86th Cong., 2nd Sess., 1960.

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U. S. Congress. Water Resources Research Act of 1964. An Act to establish water resources research centers, to promote a more adequate national program of water research, and for other purposes. Public Law 379, 88th Cong., 2nd Sess., 1964.

U. S. Congress. Land and Water Conservation Fund Act of 1965. An Act to establish a land and water conservation fund to assist the States and Federal agencies in meeting present and future outdoor recreation demands and needs of the American people, and for other purposes. Public Law 578, 88th Cong., 2nd Sess., 1964.

U. S. Congress. Federal Water Project Recreation Act. An Act to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and for other purposes. Public Law 72, 89th Cong., 1st Sess., 1965.

U. S. Congress. Water Resources Planning Act. An Act to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission, and by providing financial assistance to the States in order to increase State participation in such planning. Public Law 80, 89th Cong., 1st Sess., 1965.

U. S. Congress. National Wildlife Refuge System--Disposition of Lands. An Act to restrict the disposition of lands acquired as part of the National Wildlife Refuge System. Public Law 404, 90th Cong., 2nd Sess., 1968.

U. S. Congress. National Water Commission Act. An Act to provide for a comprehensive review of national water resource problems and programs, and for other purposes. Public Law 515, 90th Cong., 2nd Sess., 1968.

U. S. Congress. Land and Water Conservation Fund. An Act to amend Title 1 of the Land and Water Conservation Fund Act of 1965, and for other purposes. Public Law 401, 90th Cong., 2nd Sess., 1968.

U. S. Congress. Water Resources Planning Act--Administration. An Act to amend the Water Resources Planning Act to revise the authorization of appropriations for administering provisions of the Act, and for other purposes. Public Law 547, 90th Cong., 2nd Sess., 1968.

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1968b. Wild and Scenic Rivers Act, Public Law 90-542, Oct. 2, 1968.

Provides for classification and designation of a national system of wild rivers for canoeing, kayaking and rafting in a natural and wilderness environment.

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U.S. Congress, Committee on Interior and Insular Affairs. 1968. An Act to provide for a National Wild and Scenic Rivers System, and for other purposes. (82 Stat. 906) 90th Congr. 1st. sess., P.L. 90-542. 12 p.

"National Environmental Policy Act of 1969," Public Law 91-190, 91st Congress, S. 1075, January 1, 1970. 26.

"Water Pollution Control Legislation - 1971, Oversight of Existing Program," Hearings before the Committee on Public Works of the House of Representatives, 92d Congress, First Session, U. S. Government Printing Office, \$3.25. 57.

U.S. Congress, Committee on Interior and Insular Affairs. 1972. An Act to amend the Wild and Scenic Rivers Act by designating a segment of the St. Croix River, Minnesota and Wisconsin, as a component of the National Wild and Scenic Rivers System. (86 Stat. 1174) 92nd Congr. 2nd. sess., P.L. 92-560.

U.S. Congress, Committee on Interior and Insular Affairs. 1974. An Act to amend the Wild and Scenic Rivers Act by designating the Chattooga River, North Carolina, South Carolina and Georgia as a component of the National Wild and Scenic Rivers System, and for other purposes. (88 Stat. 122) 93rd Congr. 2nd. sess., P.L. 93-279. 2 p.

Legislative history: House Bill 9492, House Report 93-675, Senate Report 93-738.

U.S. Congress, Committee on Interior and Insular Affairs. 1975. An Act to amend the Wild and Scenic Rivers Act (82 Stat. 906), as amended, to designate segments of certain rivers for possible inclusion in the National Wild and Scenic Rivers System: to amend the Lower St. Croix River Act of 1972 (86 Stat. 1174), and for other purposes. (88 Stat. 2094). 93rd Congr. 2nd. sess., P.L. 93-621. 3 p.

Legislative history: Senate Bill 3022, Senate Report 93-1207, House Report 93-1359, Conference Report 93-1645.

U.S. Congress, Committee on Interior and Insular Affairs. 1975. An Act to establish the Hell's Canyon National Recreation Area in the States of Oregon and Idaho, and for other purposes. (89 Stat. 1117) 94th Congr. 1st. sess., P.L. 94-199. 7 p.

Legislative history: Senate Bill 322, Senate Report 94-153, House Report 94-607.

U.S. Congress, Committee on Interior and Insular Affairs. 1976. An Act to amend the Wild and Scenic Rivers Act, and for other purposes. (New River, North Carolina and Virginia) (90 Stat. 1238) 94th Congr. 2nd. sess., P.L. 94-407. 1 p.

Legislative history: House Bill 13372, House Report 94-1264, Senate Report 94-952; also see House Report 93-1419, Senate Report 93-831.

U.S. Congress, Committee on Interior and Insular Affairs. 1976. An Act to amend the Wild and Scenic Rivers Act, and for other purposes. (Missouri, Feather, Flathead, Housatonic, Obed, Piedra Rivers) (90 Stat. 2327) 94th Congr. 2nd. sess., P.L. 94-486. 4 p.

Legislative history: Senate Bill 1506, Senate Report 94-502, House Report 94-1657.

U.S. Department of Interior, Bureau of Outdoor Recreation. 1970. National symposium on wild, scenic and recreational waterways: proceedings. September 10-12, 1970. 209 p. St. Paul, Minnesota.

A collection of papers that reviews the Wild and Scenic Rivers Act of 1968, answers the most frequently asked questions regarding the Wild and Scenic Rivers System, discusses complementary State river programs, and outlines methods for implementing the various rivers programs.

Bureau of Outdoor Recreation, Department of Interior. 1972. Land and Water Conservation Fund. Assistance for Public Outdoor Recreation Fact Sheet. Washington, D.C.: U.S. Government Printing Office, 1972.

1973 Wild and scenic rivers. 16p., pamph. USDI Bur. Outd. Rec. and USDA For. Serv. Wash., D.C.: U.S. Gov. Print. Off., #0-508-595.

Summarizes the main points of the Wild and Scenic Rivers Act, 1968. All or portions of 8 rivers were designated in the Act as original components of the system; 27 other rivers were designated as potential additions and these were protected up to 5 years by moratorium (Congress is considering a proposal to extend it another 5 years). The Act establishes three classifications of rivers: wild river areas; scenic river areas; and recreational river areas. Wild river areas are "those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted." This pamphlet also summarizes the administrative policies and degree of protection as outlined by the Act. A map of the National Wild and Scenic Rivers System is included. (Also see, from USDI, Bur. Outd. Rec. and USDA For. Serv., Wash., D.C. "Guidelines for Evaluating Wild, Scenic and Recreational River Areas.....". 12p. (mimeo.).).

USDI - Bureau of Land Management 1976. Bureau of Land Management - Wild and Scenic River Management. 41.p.

Comprehensive outline of BLM management policy related to Wild Rivers, Scenic Rivers, and Recreational Rivers.

United States Bureau of Outdoor Recreation - Northeast Region.
1974. A look at the Wild and Scenic Rivers Act.
Conservation Action/Metro Planning Div., USDI Bur.
Outd. Rec., Tech. Assistance Pap., Series B, Pap. 1
(prepared by William Bock and Frank Thomas), 18 p.

Abstract: This paper has been prepared as a quick reference guide for persons having an interest in the Wild and Scenic Rivers Act. It is divided into two parts: Outline of the Act, and Legal Opinions on the Act. It provides answers to some of the questions that have arisen regarding the interpretation of various sections or phrases of the Act.

Keywords: Wild and Scenic Rivers Act, Waterway Preservation.

U.S. Department of Interior, Bureau of Outdoor Recreation. 1977. Outdoor recreation action: wild and scenic river. 43:1-48.

Discusses America's wild and scenic rivers and efforts to protect and preserve them. Articles feature: a status report on river preservation and recreation programs; a summarization of various State stream protection programs (key contacts in State government charged with river protection are listed); a review of Federal Wild and Scenic River protection efforts; and a summary of the River Recreation Management and Research Symposium held in Minneapolis in January 1977.

*Hydroelectric Power Potential of
Rivers Named in Public Law 90-
542, The Wild and Scenic Rivers
Act; Federal Power Commission,
Bureau of Power; March 1969.*

Federal Register. 1970. Allagash Wilderness Waterway Maine: notice of approval for inclusion in National Wild and Scenic River System as State administered wild river area. 35(138):11525-11526.

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U. S. Federal Water Pollution Control Administration. Report of the National Technical Advisory Committee on Water Quality Criteria to the Secretary of the Interior. Washington, D.C.: U. S. Government Printing Office, 1968.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. St. Croix National Scenic Riverway. 91st Congr. 1st. sess., House Document 91-165. 24 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1969. Wolf National Scenic Riverway. 91st Congr. 1st. sess., House Document 91-166. 3 p.

Legislative History: Senate Bill 1928, Senate Report 92-1279, House Report 92-1579.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1972. A report on the Upper Iowa River, Iowa, pursuant to the Wild and Scenic Rivers Act of 1968. 92nd Congr. 2nd. sess., House Document 92-379. 99 p.

Miscellaneous amendments pertaining to Wild and Scenic Rivers--never enacted into public law. 1973.

Legislative history: House Report 93-621, Senate Report 93-401.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1974. Recommending the designation of the Lower Suwannee River to the National Wild and Scenic Rivers System. 93rd Congr. 2nd. sess., House Document 93-246. 120 p.

U.S. House of Representatives, Committee on Interior and Insular Affairs. 1977. Wild and Scenic River recommendations: Part V, Bruneau River, Idaho; Part VI, Pere-Marquette River, Michigan; Part VII, Dolores River, Colorado; Part VIII, Rio Grande River, Texas; Part IX, Salmon River, Idaho; Part X, Skagit River, Washington; Part XI, Upper Delaware River, New York and Pennsylvania; Part XII, Upper Mississippi River, Minnesota; Part XIII, Penobscot River, Maine; Part XIV, Gasconade River, Missouri. 95th Congr. 1st. sess., House Document 95-164.

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U. S. Senate Committee on Interior and Insular Affairs. Land and Water Conservation Fund: Hearings Before the Committee. 88th Congress, 2nd Session, July, 1964.

U. S. Senate Committee on Interior and Insular Affairs. Federal Water Project Recreation Act. Report 149. Washington, D.C.: U. S. Government Printing Office, 1965.

"Water and Related Land Resources Planning - A Policy Statement," U. S. Water Resources Council, July 22, 1970. 65.

Utter, Jack G., and John D. Schultz. 1976. A handbook on the Wild and Scenic Rivers Act. 44 p. Sch. For., Univ. Montana, Missoula, Montana.

Booklet is divided into four parts: (1) text of the Act, (2) section-by-section review of the Act, (3) texts of legislation enacted by Congress since the Act passed that pertain directly to the Act, and (4) Federal regulations and the Wild and Scenic Rivers Act.

Walker, W. R. and W. E. Cox. "Jurisdiction of the Federal Power Commission Over Non-power Water Uses," Land and Water Law Review, 5 (1970), 65.

WALKER, WILLIAM R, COX, WILLIAM E., BUHYOFF, MARILYN B.
1978. PUBLIC RECREATION RIGHTS IN SURFACE WATERS.
IN SOUTHEASTERN TROUT RESOURCE: ECOLOGY AND MANAGEMENT
SYMP. PROC. P. 122-133. USDA FOR. SERV., SOUTHEASTERN FOR.
EXP. STN., ASHEVILLE, NORTH CAROLINA.

DISCUSSES THE PUBLIC'S RIGHT TO USE WATERWAYS FOR
RECREATIONAL PURPOSES IN THE UNITED STATES. RIGHTS VARY
GREATLY FROM STATE TO STATE. A NUMBER OF FACTORS, INCLUDING
NAVIGABILITY, OWNERSHIP OF THE BED OF THE BODY OF WATER,
RECOGNITION OF A PUBLIC TRUST DOCTRINE, AND CUSTOM AND USAGE
OVER TIME, ARE DETERMINANTS IN DEFINING THE RIGHTS OF THE
PUBLIC TO USE SURFACE WATERS FOR RECREATION.

Waite, G. Graham. "Public Rights in Maine Waters." Reprint from Maine Law Review, 1965.

Waite, G. G. "Beneficial Use of Water in a Riparian Jurisdiction,"
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4. MISCELLANEOUS RESEARCH ACTIVITY

A. WATER QUALITY SURVEYS, STUDIES AND STANDARDS

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Abstract: Study undertaken to develop aesthetic water quality criteria for recreation uses, which in turn could be used to enhance the quality of the recreation experience. Water quality components which affect recreation user perception were identified. Recreation users were compared at nine sites on their attitudes, beliefs, and behaviour concerning water quality characteristics.

Keywords: Water Quality Criteria, Water-Oriented Recreation, User Perceptions, User Characteristics.

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444 INTERVIEWS WITH	ATTITUDE STATEMENTS	WATER
BEACH USERS + 222		BEACHES
HOME-BASED INTERVIEWS		POLLUTION
		SWIMMING

It is suggested that there are differences in the evaluation of water pollution by recreationists using the water and technicians and managers concerned with its management. A survey of beach-users sought information on: activities, preferred sites, frequency of participation, and evaluation of and awareness of water quality and pollution. Each of the 12 interview sites are also evaluated by the interviewers using set criteria. A home interview survey was also administered, gathering information on beach usage. Respondents were found to be very aware of the pollution problem. Generally pollution was associated with water appearance. It was found that people who swim evaluated the water as less polluted than those who did not. More frequent visitors to sites were more critical of the water quality. Attitudes toward water quality were related to attitudes toward 'man and nature', ^{and nature', only} relating to ^{relating to} ~~man and nature~~ and Strodbeck's subjugation/harmony/mastery division of man's relation to nature.

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Keywords: Water Quality Criteria, Water-Oriented Recreation, Swimming, Recreational Impact, Water Pollution, Boating.

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Abstract: The large increase in water based recreation participation and the major attraction of clean water for outdoor recreation prompted this study. Specific investigation was the recreationist's perception of present water quality and quantity allied with an attempt to indicate the preferences and tolerance levels of water quality and quantity which would be acceptable in the recreational experience.

Need for this study was indicated because: (1) water quality and quantity contributions to the recreational experience have not been defined, (2) this definition is essential for making supply and demand predictions of forest-water oriented recreation and (3) identification of what recreationists consider to be water pollution could supplement existing water quality measures, help determine relative priorities of these measures, or even result in redefinition of some measures.

Keywords: Water Quality Criteria, Water Pollution, Water-Oriented Recreation, User Perceptions, Minnesota.

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PRESENTS THE RESULTS FROM AN INITIAL EFFORT TO DESIGN AND IMPLEMENT A PROGRAM FOR A CONTINUING INVENTORY OF THE WATER QUALITY CONDITIONS OF STREAMS IN NORTH CAROLINA. UNDER STUDY IS WATER QUALITY VARIABILITY, POLLUTION LOADS, AND TRENDS AT KEY LOCATIONS ON THE STATE'S MAJOR RIVERS. DESCRIBES DATA COLLECTION AND ANALYSIS USING THE NEUSE RIVER AS AN EXAMPLE.

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Abstract: A comprehensive document on water quality requirements to be used as a basic reference by those groups engaged in water quality studies and standards setting activities. Regional variations in climate, topography, hydrology, geology and other factors must be considered in applying these criteria in specific localities. The report is subdivided into criteria for five general areas of water use: (1) recreation and aesthetics, (2) public water supplies, (3) fish, other aquatic life, and wildlife, (4) agriculture, and (5) industry. Section 1, "recreation and aesthetics", serves as a basis for developing water quality standards for "wild", "scenic" and "recreational" rivers preservation programs. Recommended criteria for aesthetic purposes include: (1) all surface waters should contribute to the support of life forms of aesthetic value, and (2) surface waters should be free of substances attributable to discharges or waste (eg. floating debris, oil substances producing objectionable colour, odor, taste or turbidity. Several recommended criteria are set forth for recreational use, including both "primary contact" recreation (eg. swimming) and "secondary contact" recreation (eg. fishing, hunting, viewing).

Keywords: Water Quality Criteria, Aesthetics, Water-Oriented Recreation, Swimming.

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SELECTED RIVER GUIDEBOOKS

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Rogue River.

USDI - Bureau of Land Management, Running the Green River from Sand Wash to Green River, Utah.

Good pamphlet with detailed maps showing rapids, hazards, points of interest, and points of access. Accompanying description of natural history along the river is included.

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